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Revue canadienne de PRÉVENTION DES INFECTIONS

The official journal of the Community and Hospital Infection Control Association – Canada • Association pour la prévention des infections à l'hôpital et dans la communauté – Canada

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Public reporting of HAI rates
don't shoot the messenger

Pat Piaskowski, RN, HBScN, CIC
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In some Canadian provinces, as well as in the United States (US), there is a requirement for healthcare facilities to publicly report healthcare-acquired infection (HAI) and infection prevention and control (IPAC) data. In some cases, in addition to this requirement for public reporting, there is a growing trend to use this data in determining healthcare funding and scores on balanced scorecards. These rates may also be used to determine executive compensation and, in the US, insurance reimbursements.

Infection control professionals (ICPs) play a vital role in collecting and reporting this data. ICPs must understand and apply criteria for reporting and then consistently apply these over time in order to provide accurate data. For some infectious processes this may be more challenging than for others. When one considers the complexities of surveillance for an infection such as a ventilator-associated pneumonia, the challenge of accurately gathering this data increases. This may lead to variability in reported infection rates. With measurement of compliance with infection prevention activities such as hand

hygiene there is the added complexity of the skill of the observers as well as the potential impacts of the Hawthorne effect (are workers are more likely to perform hand hygiene when they are aware they are being watched?).

While data collected in the same way by the same individuals over time may be comparable, it becomes more challenging to compare data collected in different facilities. These facilities may devote different resources to and perform varying intensities of surveillance. It is clear that if a facility has a more robust surveillance system that they will find more infections (1). In the converse, a less robust surveillance system may find fewer infections. The author of a recent paper in AJIC states: "with increased mandatory public reporting… the interinstitutional variability introduced by surveillance techniques warrants further scrutiny – both to improve public health through accurate measurement, but also reduce the possibility of gaming the system or being punitive to centers exercising diligence."

The increasing accountability and transparency that public reporting of HAI data brings must, however, be balanced with the impacts of using this data as a measure of performance for either facilities or individuals leading the facilities.

Although the data in most cases is provided by the ICP and the IPAC team, this does not equate to the ICP and IPAC team "owning the data." The findings reflected in the data are the result of a complex interaction of many factors (patient case mix, service delivery methods and structures, organizational commitment to and resources for IPAC and health care resources in general) which ultimately contribute to the infection rate or performance compliance rate. Facilities must ensure that the responsibility and accountability for the results does not rest solely on the IPAC team or ICP. The IPAC team and ICP are just one part of the organization and can only be successful in supporting the facility in achieving favourable outcomes when the facility provides the needed infrastructure, resources and support for the IPAC program.

"The increasing accountability and transparency that public reporting of HAI data brings must, however, be balanced with the impacts of using this data as a measure of performance for either facilities or individuals leading the facilities."

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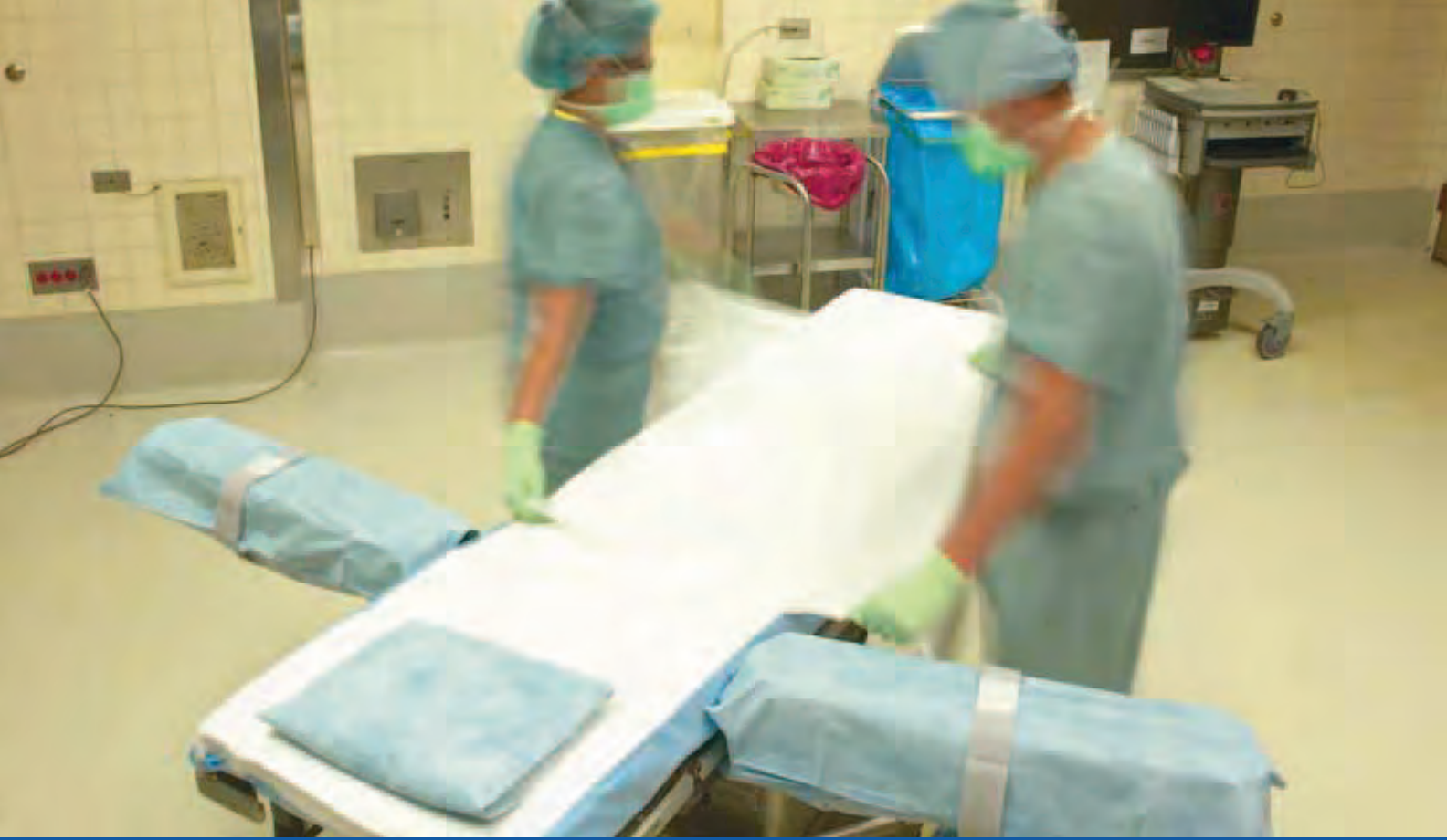

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The content of pandemic influenza plans of acute care hospitals in Ontario

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ABSTRACT

Objective
The content of pandemic influenza plans in acute care hospitals in Ontario was examined in the context of meeting the key challenges of beds, equipment and supply, and staff shortages that would result from a virulent influenza pandemic.

Methods
All acute care hospitals in Ontario were contacted in 2007 regarding a pandemic influenza preparedness survey that was completed by the person most responsible for developing the hospital's pandemic influenza plan.

Results
The response rate was 78.5%, 95 of 121 hospitals participated and 76.8% (73 of 95) had pandemic plans. The hospital services to suspend during a pandemic (91.7%, 66 of 72) and to continue (86.1%, 62 of 72) were identified by most plans; however, only a minority addressed criteria for ICU admission (31.9%, 22 of 69) and initiation (26.1%, 18 of 69) and cessation (21.7%, 15 of 69) of mechanical ventilation. While 83.3% of hospitals have ordered antivirals, there was a lack of specificity in antiviral strategies: Storage, distribution, and security procedures for antivirals were included in less than two-thirds of plans and only half (52.8%) included a priority list for antivirals.

Conclusions
There was a general lack of detail in pandemic influenza plans regarding strategies to generate surge capacity in the event of a virulent influenza pandemic. The 2009 H1N1 influenza pandemic benevolently provided insight into what might happen if a virulent influenza pandemic struck. A major lesson was that hospitals need very detailed plans in place, along with equipment and supplies, before a pandemic strikes.

KEY WORDS
Pandemic influenza;
Pandemic preparedness

INTRODUCTION

Before the 2009 H1N1 influenza pandemic, there was consensus that a virulent influenza pandemic would place considerable demands on the staff, equipment and supplies of acute care hospitals in the United States and Canada (1-7). This was borne out by the experiences of hospitals during the relatively moderate 2009 H1N1 influenza pandemic in which considerable stress was placed on intensive care units (ICUs), healthcare workers, ventilators, personal protective equipment, and antiviral and other drug supplies (8-12). To effectively manage a more severe influenza pandemic, the pandemic plans of acute care hospitals must address the challenges of bed, equipment and supply, and staff shortages.

Prior to the 2009 H1N1 influenza pandemic, only half of American hospital epidemiologists thought their hospitals were prepared for a pandemic (8). An examination of the pandemic planning process in Ontario, Canada before the 2009 H1N1 influenza pandemic found that a quarter of acute care hospitals did not have a pandemic plan and of the hospitals that did, few had formally tested their plans (13). Funding for the pandemic planning process was generally considered inadequate and there was general dissatisfaction with the completeness of hospital pandemic influenza plans (13).

The purpose of this study was to examine the content of pandemic influenza plans in acute care hospitals in Ontario in the context of generating surge capacity and meeting the key challenges of beds, equipment and supply, and staff shortages that would result from a virulent influenza pandemic.

METHODS

All acute care hospitals in Ontario were contacted in 2007 about participating in the study. The survey was completed by the person most responsible for developing the hospital's pandemic influenza plan. The survey encompassed the core components of the Canadian Pandemic Influenza Plan and the Ontario Health Plan for Pandemic Influenza (2,3). The domains surveyed and discussed in this article are command and control roles and responsibilities, human resources, equipment and supplies, infection control and occupational health, and triage and clinical care. Data were analyzed with StatView version 5.0 (SAS Institute, Cary, NC). Hospitals with missing data were excluded from analyses involving that survey item.

RESULTS

Ninety-five of 121 acute care hospitals completed the survey, a response rate of 78.5%. Three-quarters (76.8%, 73 of 95) of hospitals had pandemic influenza plans.

> "In the event of a severe influenza pandemic, the criteria for hospital and ICU admittance and the allocation of ventilators will be of great importance."

Command and control roles and responsibilities

Two-thirds (65.3%, 47 of 72) of hospitals based their pandemic influenza plans on the Incident Management System (IMS) model. The pandemic plans of 84.7% (61 of 72) of hospitals specifically addressed the roles and responsibilities and 77.8% (56 of 72) the decision-making processes within the hospital. A majority (72.9%, 51 of 70) of hospital plans specified the relationship with the command and control structure of the local Public Health Unit.

Human resources

Those hospital services to suspend during a pandemic (91.7%, 66 of 72) and which to continue (86.1%, 62 of 72) were addressed by the vast majority of plans (Table 1). Only a third of pandemic plans addressed the staffing of alternative care sites (36.1%, 26 of 72) and potential roles for family members (36.1%, 26 of 72). Many hospitals (87.5%, 56 of 64) planned to recruit volunteers during a pandemic through existing hospital volunteer groups and two-thirds (68.8%, 44 of 64) planned to use lists of retirees, by professional association.

Surge capacity

Surge capacity issues related to beds (97.1%, 67 of 69), elective services (91.3%, 63 of 69), on-site supplies (87.0%, 60 of 69), and ventilators (78.3%, 54 of 69) were addressed by the majority of hospitals. Only a quarter of hospitals (26.1%, 18 of 69) addressed parking capacity. Few hospitals (13.9%, 10 of 72) had mutual aid agreements with other hospitals and referral centers in their district.

Over 90% of pandemic plans identified personal protective equipment (PPE) such as N95 respirators, surgical masks, gloves, gowns, face shields and eye protection, and hand hygiene products as critical supplies (Table 2). Over three-quarters of hospitals had purchased a four-week stockpile of PPE (Table 2). A third (32.4%, 22 of 68) of plans identified cots as critical supplies and only a tenth (9.1%, 4 of 44) had purchased cots.

Table 1 Key human resource components addressed in hospital pandemic influenza plans

Key human resource components (n = 72)	N (%)
Identification of services your hospital will suspend during pandemic	66 (91.7)
Identification of services your hospital will continue during pandemic	62 (86.1)
Strategy for communicating with all staff	56 (77.8)
Current human resource staffing inventory identifying staff numbers, by professional group	55 (76.4)
Potential roles for volunteers	55 (76.4)
Establishment of a redeployment centre to assign job functions during pandemic	48 (66.7)
Projections of staff available during a pandemic	45 (62.5)
Labor relations issues	45 (62.5)
Potential roles for retired staff	44 (61.1)
Education/training strategy for all staff, retirees, volunteers, and students	44 (61.1)
Human Resource staffing inventory that list skill sets of current staff	43 (59.7)
Projections of staff requirements for essential services	41 (56.9)
Potential roles for students	41 (56.9)
Staffing of alternative care sites	26 (36.1)
Potential roles for family members	26 (36.1)
Methods to recruit volunteers (n = 64)	
Existing hospital volunteer groups	56 (87.5)
Lists of retirees, by professional association	44 (68.8)
Established volunteer organizations in the community	27 (42.2)
Student associations	25 (39.1)

Infection control and occupational health

Infection control and occupational health issues such as routine practices for infection control (100%), hand hygiene (97.2%, 69 of 71), influenza transmission (95.8%, 68 of 71), and personal protective equipment (95.8%, 68 of 71) were addressed by most pandemic influenza plans (Table 3). Issues associated with the use of antivirals for pandemic influenza were addressed in 94.4% (67 of 71) of pandemic plans and the use of pandemic influenza vaccinations was included in 88.7% (63 of 71) (Table 3). Half (52.8%, 38 of 72) of plans included a priority list for receiving antivirals and 41.7% (30 of 72) of plans included a priority list for receiving vaccinations.

Triage and clinical care

The clinical care section of all hospital plans addressed the screening of new patients and visitors for febrile respiratory illness (Table 4). Triage procedures were outlined 89.9% (62 of 69) of the time. Only a minority of plans addressed the important issues of criteria for ICU admission (31.9%, 22 of 69) and initiation (26.1%, 18 of 69) and cessation (21.7%, 15 of 69) of mechanical ventilation for patients.

DISCUSSION

This examination of the content of the pandemic influenza plans of Ontario's acute care hospitals found there was a general lack of detail in how hospitals would generate needed surge capacity in the event of a virulent influenza pandemic. The key challenges of beds, equipment and supply, and staff shortages presented by a pandemic need to be addressed with greater rigour and depth in hospitals' pandemic influenza plans.

The high response rate to the survey means that the results can be generalized to the pandemic influenza plans of all acute care hospitals in Ontario that had pandemic plans. It should be noted that a quarter of Ontario's hospitals did not have specific pandemic influenza plans (13).

From 15 to 20% of patients hospitalized during the 2009 H1N1 influenza pandemic progressed to the ICU, causing pressure on critical care resources (11,14). For example, there was full occupancy of regional ICU beds in Winnipeg, Manitoba, site of a major outbreak of the 2009 H1N1 influenza pandemic and 81% of pandemic influenza patients admitted to an ICU underwent mechanical ventilation for a median of 12 days and a third received advanced ventilation support and rescue therapies (9). In Australia and New Zealand there were also increased utilization of ICU beds by patients infected with the 2009 H1N1 influenza pandemic virus and 65% of these ICU patients received mechanical ventilation (11). These studies highlight the need for hospitals to develop ICU surge capacity and to stockpile adequate ventilation equipment and supplies, including pharmaceuticals.

Most Ontario hospitals have planned for which clinical services to suspend and which to continue and outlined triage procedures in order to open beds for pandemic influenza patients. However, less than half have outlined the criteria for general hospital admission and only a third have criteria for ICU admission.

Only a tenth of hospitals have stockpiled cots for hospitals or alternative care sites. It is projected there will be greater need for patient ventilation than ventilators, yet only a quarter of hospitals have determined the criteria for starting and removing patients from ventilators. In the event of a severe influenza pandemic, the criteria for hospital and ICU admittance and the allocation of ventilators will be of great importance.

In the initial stage of the 2009 H1N1 influenza pandemic a third of American hospitals had antiviral shortages and personal stockpiling of antivirals was a problem (8). In Manitoba physicians found they had to prescribe oseltamivir to pandemic influenza patients for courses of a minimum of 10 days rather than five days (12). Most Ontario hospitals plan to use antivirals in a pandemic and over 80% have ordered antivirals; however, there was a lack of specificity in antiviral strategies. Storage, distribution, and security procedures for antivirals were described in less than two-thirds of hospital pandemic plans and only half of hospitals delineated

Table 2 Identified and purchased four-week stockpile of critical supplies

Critical supplies	*Identified N (%)	**Purchased N (%)
Gloves	65 (95.6)	36 (81.8)
Gowns	65 (95.6)	36 (81.8)
Face shields and eye protection	64 (94.1)	33 (75.0)
N95 respirators	63 (92.6)	36 (81.8)
Surgical masks	63 (92.6)	33 (75.0)
Hand hygiene products	63 (92.6)	33 (75.0)
Disinfectants	55 (80.9)	27 (61.4)
Temperature and BP monitoring supplies	51 (75.0)	19 (27.9)
Respiratory care	51 (75.0)	20 (45.5)
Cleaning supplies	50 (73.5)	22 (50.0)
IV products and supplies	49 (72.1)	19 (43.2)
Suction	47 (69.1)	16 (36.4)
Injections for pandemic influenza vaccine	46 (67.6)	13 (29.5)
Medications (on formulary not necessarily antivirals)	44 (64.7)	14 (31.8)
Diagnostic supplies	43 (63.2)	15 (34.1)
Dressing supplies for vaccine injections	37 (54.4)	16 (36.4)
Deceased body management	34 (50.0)	14 (31.8)
Instructions/forms	31 (45.6)	9 (20.5)
Cots	22 (32.4)	4 (9.1)

* (n = 68) ** (n = 44)

"In preparation for the next pandemic, hospitals need human resource strategies in place to adequately staff the hospital with sufficient trained volunteers and redeployed staff to meet the demands of increased admissions."

a priority list for receipt of antivirals. The situation was similar for pandemic influenza vaccinations. While pandemic influenza vaccinations were part of most pandemic plans, only half described storage, distribution, and security procedures and less than half included a priority list for vaccinations.

One strategy to manage staff shortages in a severe influenza pandemic is to reduce the transmission of influenza within hospitals and to mitigate staff concerns about contracting influenza in the hospital by providing personal protective equipment and antivirals to staff (15). Most Ontario hospitals plan to stockpile personal protective equipment and three-quarters plan to stockpile antivirals for prophylaxis for staff and these measures should decrease absenteeism rates during a virulent pandemic (15). The vast majority of Ontario hospital plans also include a pandemic influenza vaccination component. Healthcare worker compliance with influenza vaccination programs is; however, problematic. Many (78%) hospital epidemiologists in the United States thought influenza vaccination should be mandatory for health care workers (8).

Another strategy to deal with staff shortages is to increase the pool of frontline staff; however, the lack of detailed consideration given to this will create serious stress and poor functioning of hospitals during a pandemic. During the 2009 H1N1 influenza pandemic, physicians, residents, respiratory technologists, and nurses in Manitoba worked long hours and endured considerable stress (12). A quarter of Ontario hospitals' plans do not address the use of volunteers, who will be essential during a pandemic. Only around 60% of hospitals' plans included potential roles for retired staff and students and the training of these and other volunteers and redeployed staff. Less than 40% of pandemic plans include roles for patients' family members and the staffing of alternative care sites. In preparation for the next pandemic, hospitals need human resource strategies in place to adequately staff the hospital with sufficient trained volunteers and redeployed staff to meet the demands of increased admissions.

Aboriginal peoples in Canada, Australia and New Zealand and racial and ethnic minorities in the United States were at higher risk from the 2009 H1N1 influenza pandemic (9,11,16). Pregnant women were also identified as a vulnerable risk group (9,11,16). Hospital pandemic plans need a surveillance component to identify which groups are differentially affected by the pathogen responsible for the next pandemic in order to provide timely prevention and treatment measures for at risk patient groups.

Table 3 Issues addressed in the infection control and occupational health section of hospital pandemic influenza plans

Infection control and occupational health issues	N (%)
Routine practices for infection control (n = 71)	71 (100)
Hand hygiene (n = 71)	69 (97.2)
Influenza transmission (n = 71)	68 (95.8)
Personal protective equipment* (n = 71)	68 (95.8)
Antivirals for pandemic influenza (n = 71)	67 (94.4)
Hospital placed an order for antivirals (n = 72)	60 (83.3)
Plan includes stockpiling antivirals for prophylaxis for staff (n = 72)	55 (76.4)
Plan describes storage procedures for antivirals (n = 72)	47 (65.3)
Plan describes distribution procedures for antivirals (n = 72)	45 (62.5)
Plan describes security procedures for antivirals (n = 72)	43 (59.7)
Plan includes stockpiling antivirals for treating staff (n = 71)	41 (57.7)
Plan includes a priority list for those who will receive antivirals (n = 72)	38 (52.8)
Plan includes stockpiling antivirals for treating patients (n = 72)	29 (40.3)
Pandemic influenza vaccinations (n = 71)	63 (88.7)
Plan describes distribution procedures for vaccinations (n = 71)	39 (54.9)
Plan describes storage procedures for vaccinations (n = 71)	34 (47.9)
Plan describes security procedures for vaccinations (n = 72)	34 (47.2)
Plan includes a priority list for those who will receive vaccinations (n = 72)	30 (41.7)
Ventilation/air handling (n = 71)	39 (54.9)

*N95 respirators, gloves, gowns, surgical masks, and face shields.

CONCLUSIONS

The 2009 H1N1 influenza pandemic benevolently provided insight into what might happen if we were struck with a virulent influenza pandemic. A major lesson learned was that hospitals need to have very specific and detailed pandemic plans in place along with stockpiles of equipment and supplies before a pandemic strikes. In order for hospitals to develop, refine, and exercise pandemic plans, there is a need for dedicated fund-

ing and acknowledgement that comprehensive pandemic plans are worthy endeavours that will decrease morbidity, mortality, and social disruption when the next pandemic arises.

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Table 4 Clinical care issues addressed in hospital pandemic influenza plans

Clinical care issues	N (%)
Screening new patients and visitors for FRI at entry to facility	69 (100)
Triage procedures	62 (89.9)
Clinical services continued or suspended	57 (82.6)
Availability and distribution of beds	55 (79.7)
Laboratory procedures	49 (71.0)
Pharmacy	46 (66.7)
Availability and distribution of equipment (e.g. ventilators)	45 (65.2)
Use of primary and secondary patient assessment protocols	39 (56.5)
Criteria for general hospital admission	32 (46.4)
Clinical care pathways	28 (40.6)
Criteria for patient discharge and transfer	26 (37.7)
Alternative care sites	24 (34.8)
Criteria for ICU admission	22 (31.9)
Criteria for starting patients on ventilators	18 (26.1)
Criteria for removing patients from ventilators	15 (21.7)

(n = 69)

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Susceptibility of hospital-associated, community-associated, and laboratory MRSA strains to common antimicrobial hand hygiene products

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ABSTRACT

Background
Methicillin-resistant *Staphylococcus aureus* (MRSA) is a problematic pathogen in hospitals and community environments. Proper hand hygiene is recommended for preventing MRSA transmission; however, the efficacy of hand hygiene agents against MRSA is poorly understood.

Objective
Determine the efficacy of hand hygiene products against MRSA.

Design
Fourteen commercial hand hygiene products were evaluated using an *in vitro* Time-Kill method against nine strains of *S. aureus,* including HA-MRSA and CA-MRSA. An alcohol-based hand sanitizer (ABHS) (62% ethanol), antimicrobial hand wash (4% chlorhexidine gluconate [CHG]), and antimicrobial foaming hand wash (0.3% triclosan [TCS]) were also evaluated by an *in vivo* hand wash method against MRSA (ATCC #33591).

Results
All ABHS reduced all MRSA strains to below the limit of detection (≥6 $\log_{10}$ reduction [LR]) in 15 seconds by Time-Kill evaluation. Reduction of MRSA by non-alcohol products was variable, and was both product and strain dependent. By *in vivo* testing, the ABHS and TCS hand wash produced LRs of 2.05 and 1.93, respectively and were statistically equivalent. The CHG hand wash produced a 1.53 LR and was statistically inferior to the alcohol sanitizer and TCS hand wash.

Conclusions
These results support CDC and WHO recommendations for use of ABHS as the primary means of hand hygiene by healthcare personnel. Non-alcohol products should be chosen carefully due to the variable susceptibility of MRSA strains to non-alcohol biocides, and the formulation specific performance of these biocides. Finally, a CHG containing hand wash appears to be a poor option for MRSA reduction, particularly after a single use.

KEY WORDS
Methicillin resistant *Staphylococcus aureus* (MRSA), hand hygiene, alcohol-based hand sanitizer

INTRODUCTION

Methicillin-resistant *Staphylococcus aureus* (MRSA) has been an important pathogen in hospital environments for over 40 years (1). In the U.S., hospital-associated MRSA (HA-MRSA) typically infects patients with established risk factors including a recent medical procedure, hospitalization, or residing in a long-term care facility (2,3). In the past decade community-associated MRSA (CA-MRSA) infections in individuals without previously established risk factors have become widespread (2,4-9). A number of distinct strains of HA-MRSA and CA-MRSA have been identified using pulsed-field gel electrophoresis (PFGE) typing (10,11). USA 100 (CMRSA2) has been the most prevalent cause of HA-MRSA infections, and USA 300 (CMRSA10) is the predominant cause of MRSA skin and soft tissue infections in the community, and has recently emerged as a major causative agent for healthcare related MRSA infections, including bloodstream and surgical site infections (2,10).

Hand hygiene is considered the single most important intervention to prevent the spread of infectious microorganisms and is the first line of defense against

MRSA (12,13). The CDC and WHO recommendations for hand hygiene include washing with soap and water or use of an alcohol-based hand sanitizer (ABHS) (3,14). It is well documented that improved hand hygiene compliance, particularly increased use of ABHS, can reduce MRSA infection rates in healthcare settings (15-20). Additionally, up to 10% of healthcare workers' hands have been shown to be contaminated with MRSA, in some cases even after hand hygiene, which underscores the importance of using appropriate hand hygiene products and techniques for preventing MRSA transmission (21).

Antimicrobial hand hygiene products are available in a variety of formats, including hand washes (foam and liquid) and hand sanitizers (gel, foam, liquid, spray, and wipe). Hand sanitizers typically contain between 60% and 95% ethanol as the active ingredient. Alternatively, hand sanitizers may be based on isopropyl alcohol or quaternary ammonium compounds such as benzethonium chloride (BEC) or benzalkonium chloride (3,14). Antimicrobial handwashes typically contain triclosan (TCS), chloroxylenol (PCMX), or chlorhexidine gluconate (CHG). A study using *in vitro* Time-Kill demonstrated that the susceptibility of MRSA and GISA (glycopeptide-intermediate *S. aureus*) strains to different antimicrobials can vary widely, particularly for TCS (22). In addition, *in vivo* hand wash or fingerpad studies have shown that topical antiseptic products can have variable activity against MRSA depending upon the active ingredient (23,24). However, comparative data on the effectiveness of various hand hygiene products against clinically important strains of MRSA is currently lacking, as most *in vivo* studies of hand hygiene product efficacy focus on the gram negative organisms, *Escherichia coli* and *Serratia marcescens*.

The objective of this study was to evaluate the efficacy of various commercially available hand hygiene products and formats against multiple strains of MRSA, to determine the most appropriate strategy for reducing the burden of MRSA on the hands of healthcare workers.

METHODS

Test organisms. *S. aureus* strains used in this study are listed in Table 1.

Test products. Fourteen commercially available products were evaluated in this study and are described in Table 2.

***In vitro* Time-Kill.** *In vitro* Time-Kill suspension tests were performed following ASTM E 2315 (25) . Challenge suspensions were prepared as follows for each test strain. Tubes containing Tryptic Soy Broth (TSB) were inoculated from stock cultures, and incubated at 35°C for approximately 24 hours. The broth cultures were inoculated onto the surface of Tryptic Soy Agar (TSA) plates and incubated at 35°C overnight. Immediately prior to the study, a suspension of each challenge microorganism was prepared from the TSA plates in 0.9% Sodium Chloride Irrigation to achieve titers of approximately 1 x 10^9 CFU/mL. The initial population of each challenge suspension was determined by preparing serial ten-fold dilutions in Butterfield's Phosphate Buffer Solution with lecithin and polysorbate-80 as product neutralizers (BBP++). Using TSA with product neutralizers (TSA+), pour-plates were prepared from the inoculum dilutions. The test products were evaluated at a 99% (v/v) concentration, where an aliquot of challenge suspension was transferred to a tube containing test product and exposed for 15 seconds. Immediately following exposure, the test product/challenge suspension mixture was diluted ten-fold in BBP++ to neutralize the antimicrobial active. Appropriate dilutions were prepared in BBP++, and aliquots were pour-plated in duplicate using TSA+. Plates were incubated at 35°C for 48 to 72 hours. Following incubation, colonies were counted, and counts in the range of 30 to 300 CFU were used in the data calculations. If no counts in the range of 30 to 300 CFU were observed, those plates with colony counts closest to that range were used for the data calculations. Log_{10} reductions (LRs) were calculated according to the equation: $LR = \log_{10} IP - \log_{10} P_{EX}$, where IP = initial population of the challenge species (CFU /ml) and P_{EX} = average population after exposure to each of the test products (CFU / ml). Neutralization validation studies were performed for each test article following ASTM E 1054-02 against *S. aureus* (ATCC #6538) (26). All test products were effectively neutralized by the neutralization procedure used in this study (data not shown).

***In vivo* hand wash study.** Test products were evaluated using ASTM E 2755-10[27]. Institutional Review Board approval was obtained prior to enrolling 12 subjects in the study which was

TABLE 1 *Staphylococcus aureus* strains used in this study

Strain	Description	Source
ATCC #6538	Methicillin-susceptible *S. aureus*	ATCC[a]
ATCC #33591	Methicillin-resistant *S. aureus* (MRSA)	ATCC
NRS123	USA 400 (CMRSA7), CA-MRSA	NARSA[b]
NRS382	USA 100 (CMRSA2), HA-MRSA	NARSA
NRS383	USA 200 (CMRSA4), HA-MRSA	NARSA
NRS384	USA 300 (CMRSA10), CA-MRSA	NARSA
NRS385	USA 500 (CMRSA5), HA-MRSA	NARSA
NRS483	USA 1000, CA-MRSA	NARSA
NRS484	USA 1100, CA-MRSA	NARSA

[a] ATCC, American Type Culture Collection.
[b] NARSA, Network of Antimicrobial Resistance in *Staphylococcus aureus*.

a non-randomized crossover design. Subjects were 18-60 years of age, of mixed sex, and race. All subjects' hands were free from disorders that could have compromised the subject and the study. Subjects refrained from use of antimicrobials for seven days prior to the study. A stock culture of MRSA (ATCC #33591) was prepared by aseptically transferring contents of a lyophilized vial to approximately 5 mL of sterile TSB, which was then incubated at 35°C for 24 hours. Two 250 mL flasks, each containing approximately 125 mL TSB, were inoculated with 1 mL of the 24-hour broth culture, placed on a shaker at approximately 250 rpm, and incubated for 25 hours at 35°C. The suspension was assayed for number of organisms at the beginning and end of the use period, and was not used beyond eight hours. A practice contamination procedure was performed with water. A hand wash using a non-antimicrobial hand wash was performed to remove dirt and oil from the hands. The water temperature for all wash procedures was controlled at 40°C. A 200 μL aliquot of a suspension containing approximately 1.0 x 10^9 CFU/mL of MRSA was transferred into each subject's cupped hand. The suspension was massaged over the entire surface of the hands (front and back), not reaching above the wrists, for 30 seconds. After the timed 30-second massage, the glove juice sampling procedure was performed. It was followed with a 30-second hand wash using non-antimicrobial hand wash. This first contamination cycle provided the baseline population level. The sampling procedure was performed as follows. Immediately after contamination for baseline and after each of the three product applications, powder-free, sterile, latex gloves were placed on subjects' hands, and 75 mL of sterile stripping fluid with product neutralizers was instilled into each of the gloves. The wrists were secured, and the hands were massaged for 60 seconds. A 5 mL aliquot of the glove juice was initially diluted in 5 mL of BBP++, and then serially diluted in BBP++. After baseline wash the subject used Product A, followed by Product J, then Product N in a non-randomized design. Because Product N contains CHG, which is known to have persistent effects, Product N was used last. For each test product the procedure was as follows, a 200 μL aliquot of the microbial inoculum was evenly distributed over both hands, not reaching above the wrists and massaged over the entire surface of the hands (front and back), for 30 seconds. Within 10 seconds following the 30-second massage, the subjects applied a product. For Product A, the subjects rubbed 1.5mL over the entire surface of the hands and fingers until dry. For Product J, the subjects washed their hands for 15 seconds with 1.5mL of product followed by a 15-second rinse. For Product N, the subjects washed their hands for 15 seconds with 1.5mL of product followed by a 15-second rinse. Following the product application, the sampling procedure was performed, followed by a one-minute rinse with 70% ethanol and an air-dry, then a 30-second hand wash using non-antimicrobial hand wash. The subjects waited a minimum of 20 minutes before using the next product. Plates were prepared from appropriate dilutions using Mannitol Salt Agar, and incubated at 35°C for approximately 24 to 48 hours. Colonies were counted, and $\log_{10}$ number of MRSA per hand was calculated. Means and standard deviations were calculated for the $\log_{10}$ recovery data from baseline samples, and post-product-application samples. The LRs were calculated by calculating the differences between those values.

Statistical analysis. For the *in vivo* hand wash study, a power calculation was conducted per the instructions in the FDA TFM, and the appropriate sample size was deemed to be >20 samples, therefore a sample size of 24 was utilized in this study (30). LRs produced by the products were compared using the Fisher's Least Significant Difference test using the 0.05 level of significance for Type I (α) error.

TABLE 2 Test products used in this study

Test Product	Commercial Name	Manufacturer	Active Ingredient
A	PURELL® Instant Hand Sanitizer	GOJO Industries	62% Ethanol
B	PURELL® Instant Hand Sanitizer Foam	GOJO Industries	62% Ethanol
C	PURELL® Hand Sanitising Gel VF481™	GOJO Industries	70% Ethanol
D	GOJO® Medical Hand Sanitizer	GOJO Industries	80% Ethanol
E	PURELL® Surgical Scrub	GOJO Industries	70% Ethanol
F	PURELL® Alcohol Hand Sanitizing Wipes	GOJO Industries	62% Ethanol
G	PURELL® Sanitizing Wipes	GOJO Industries	0.10% BEC[a]
H	PURELL® Cleansing and Sanitizing Towel	GOJO Industries	0.15% BEC
I	PROVON® Medicated Lotion Soap with Triclosan	GOJO Industries	0.3% TCS[b]
J	PROVON® Foaming Medicated Handwash with Moisturizers and Triclosan	GOJO Industries	0.3% TCS
K	MICRELL® Antibacterial Lotion Soap with Chloroxylenol	GOJO Industries	0.3% PCMX[c]
L	MICRELL® Antibacterial Foam Handwash	GOJO Industries	0.5% PCMX
M	GOJO® Ultra Mild Antimicrobial Lotion Soap with Chloroxylenol	GOJO Industries	0.6% PCMX
N	Hibiclens Antiseptic/ Antimicrobial Skin Cleanser	Molnlycke Healthcare	4% CHG[d]

[a]BEC: benzethonium chloride; [b]TCS: triclosan;
[c]PCMX: chloroxylenol; [d]CHG: chlorhexidine gluconate

TABLE 3 Efficacy of commercial hand hygiene products against nine strains of *Staphylococcus aureus,* based on Log_{10} reductions after 15-second *in vitro* Time-Kill exposure

		Laboratory (ATCC) Strains		Community-Associated MRSA Strains				Hospital-Associated MRSA Strains		
Test Product	Active Ingredient	ATCC 6538	ATCC 33591	USA 400	USA 300	USA 1000	USA 1100	USA 200	USA 500	USA 100
A	62% Ethanol	>6.149	>6.297	>6.152	>6.234	>7.045	>7.135	>6.929	>6.250	>6.134
B	62% Ethanol	>6.149	>6.297	>6.152	>6.234	>7.045	>7.135	>6.929	>6.250	>6.134
C	70% Ethanol	>6.149	>6.297	>6.152	>6.234	>7.045	>7.135	>6.929	>6.250	>6.134
D	80% Ethanol	>6.149	>6.297	>6.152	>6.234	>7.045	>7.135	>6.929	>6.250	>6.134
E	70% Ethanol	>6.149	>6.297	>6.152	>6.234	>7.045	>7.135	>6.929	>6.250	>6.134
F	62% Ethanol	>6.149	>6.297	>6.152	>6.234	>7.045	>7.135	>6.929	>6.250	>6.134
G	0.10% BEC[a]	5.848	4.964	1.367	>6.234	6.200	5.918	>6.929	1.462	4.256
H	0.15% BEC	>6.149	>6.297	5.851	>6.234	>7.045	>7.135	>6.929	>6.250	>6.134
I	0.3% TCS[b]	2.104	1.399	3.683	1.351	0.992	0.576	0.420	2.287	0.602
J	0.3% TCS	>5.149	3.111	4.223	2.241	4.407	1.941	2.807	3.972	0.430
K	0.3% PCMX[c]	2.116	1.405	2.904	1.205	0.791	<0.436	<0.230	1.928	1.321
L	0.5% PCMX	5.409	3.002	4.499	2.217	4.858	1.977	2.902	3.906	0.338
M	0.6% PCMX	1.496	1.297	2.210	0.989	<0.346	<0.436	<0.230	1.617	0.668
N	4% CHG[d]	0.892	1.221	0.320	0.957	1.305	0.840	1.244	0.483	0.913

[a]BEC: [b]enzethonium chloride; [b]TCS: triclosan; [c]PCMX: chloroxylenol; [d]CHG: chlorhexidine gluconate
A > symbol indicates that there was complete kill at the limit of detection,
the < symbol indicates that the lowest dilution plated was too numerous to count.

RESULTS

***In vitro* Time-Kill.** Results for 14 products evaluated by *in vitro* Time-Kill against one methicillin-susceptible *S. aureus* (MSSA) and eight MRSA strains are summarized in Table 3. Hand sanitizers containing ethanol from 62% to 80% (v/v) (test products A through F) reduced all strains to below the limit of detection (>6 LR) in a 15-second exposure. Test products containing non-alcohol active ingredients (G through N) displayed a wide range of efficacy. None of these products achieved complete inactivation of all strains, and only Product H (0.15% BEC) produced LRs of at least five against all strains. Of the hand wash products, Product J (0.3% TCS) and Product L (0.5% PCMX) each achieved at least a 3 LR against 4 of the 8 MRSA strains and a greater than 5 LR against the MSSA strain. Product N (4% CHG) failed to reduce any strain by more than 1.4 log_{10}.

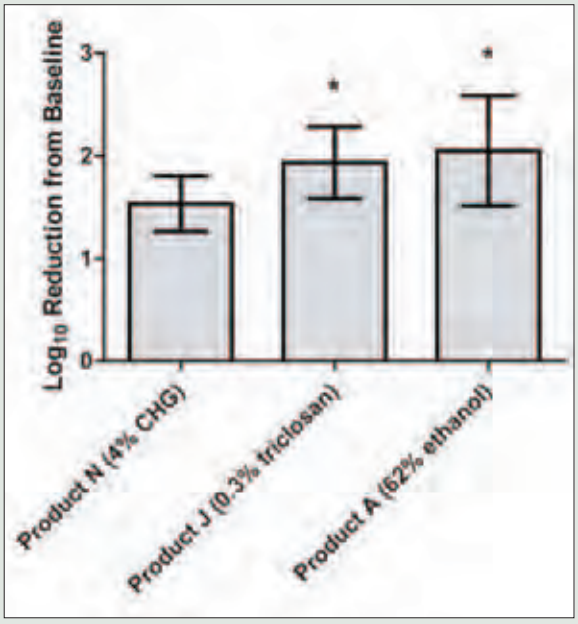
***In vivo* hand wash study.** Products A, J, and N were evaluated on the hands of adult subjects contaminated with MRSA to simulate actual use conditions and to represent the most common active ingredients found in healthcare hand hygiene products. The mean baseline value (± standard deviation) was 8.55±0.13. LRs from baseline were 2.05±0.54, 1.93±0.35, 1.53±0.27 for Product A, Product J, and Product N, respectively. LRs for Product A and Product J were statistically equivalent and were significantly greater than the LR produced by Product N ($P \leq 0.05$) (Figure 1).

DISCUSSION

ABHS were the only test products to achieve complete reduction of all MRSA strains beyond the limit of detection by the *in vitro* Time-Kill method. These data are consistent with the observations of Wooton *et al* (22). The efficacy of ABHS was not surprising as ethanol is a known antimicrobial that causes cell membrane damage, protein denaturation, and subsequent cell lysis (28). Alcohol level (62-80%) and format (gel, foam, wipe) did not affect activity. Additional Time-Kill studies have demonstrated that the minimum ethanol level required to completely inactivate some MRSA strains ranges between 50-55% (v/v) (data not shown), and all products were above this level. These data support CDC and WHO recommendations for use of ABHS for prevention of MRSA transmission. While there were no products tested in this study that contained isopropanol as the active ingredient, these products would be expected to behave in a similar manner to the ethanol-based hand sanitizers. However, additional testing should be conducted with isopropanol-based hand sanitizers to confirm these findings for alcohol-based hand sanitizers in general.

In contrast, the activity of test products containing BEC, TCS, PCMX or CHG ranged from complete inactivation to less than 0.23 log_{10} reduction against MRSA by *in vitro* Time-Kill experiments. Activity of these test products was dependent

FIGURE 1 *In Vivo* Efficacy of Commercial Hand Hygiene Products Against MRSA (ATCC #33591), Based on Log_{10} Reductions from Baseline.



* Products A and J achieved a significantly greater mean log_{10} reduction from baseline than Product N ($P \leq 0.05$).

CHG: chlorhexidine gluconate; error bars represent standard deviation

upon the identity and concentration of the active ingredient, the test product formulation, and the delivery format (liquid or foam). Of the non-alcohol active ingredients, test products based on the quaternary ammonium compound, BEC, displayed the greatest efficacy against MRSA. Product H (0.15% BEC) was more effective than Product G (0.1% BEC) implicating active ingredient concentration as a key determinant of BEC efficacy. The activities of TCS based products were highly dependent upon the specific product formulation. Two products containing the same level of TCS produced different results; specifically product J achieved greater LRs than product I against all but one MRSA strain tested. This was also the case for PCMX products, where Product L consistently produced higher LRs than Product M, despite having a lower concentration of PCMX. Interestingly, for both the TCS and PCMX products, the foam format appears to be more efficacious. The CHG-based product failed to effectively reduce MRSA *in vitro*, and had lower efficacy than the other non-alcohol actives.

There was also considerable variation in relative sensitivities of different *S. aureus* strains to non-alcohol products by Time-Kill experiments. MRSA strains USA 400 (CMRSA7) and USA 500 (CMRSA5) were the most resistant strains to killing by BEC and were the only strains against which Product G failed to achieve greater than a 4 LR. Furthermore, USA 400 (CMRSA7) was the only strain against which Product H failed to achieve complete inactivation. Similar to BEC-based products, USA 400 (CMRSA7) and USA 500 (CMRSA5) were the most resistant strains to CHG. These differences are consistent with data in the literature regarding the potential for *S. aureus* strains to develop resistance to quaternary ammonium compounds and CHG, and the involvement of efflux mechanisms (28-29). Recently, a strain of highly antibiotic and antiseptic resistant MRSA implicated in a two-year outbreak was sequenced and found to harbor the *qacA* efflux gene (30-31). Interestingly, this strain was found to resist decolonization by a chlorhexidine-based protocol which was highly effective against other MRSA strains which suggested that the decolonization protocol may have promoted transmission of the resistant strain (29). The TCS-containing hand washes also showed variable efficacy depending on the test strain. Product J achieved only a 0.430 LR against USA 100 (CMRSA2), but achieved complete kill against MSSA (>5 LR). The PCMX-based products showed a wide range of efficacy depending on the strain, with a 5.409 LR for MSSA and as low as a 0.338 LR for USA 100 (CMRSA2) for Product L. Not surprisingly, strains behave different depending on the active tested, for example USA 400 (CMRSA7) was one of the most difficult strains to kill for BEC and CHG, but was one of the easiest strains to kill for the PCMX and TCS products. Since various MRSA strains are found in healthcare environments (2,10), it is wise to choose a product that will be efficacious against multiple MRSA strains, particularly so as to avoid the potential for selection of biocide resistant strains. Therefore, prior to purchasing a hand hygiene product for the prevention of MRSA, it is important to critically evaluate the data for all non-alcohol hand hygiene products.

One of the limitations of *in vitro* testing is that it does not account for the physical removal of organisms achieved with hand washing; therefore *in vitro* test data may underestimate the performance of hand wash products. To ensure that the conclusions made from *in vitro* test data were reliable, three test products with various active ingredients were tested *in vivo* against a MRSA strain with intermediate susceptibility, MRSA (ATCC #33591). The *in vivo* hand wash methodology used in this study was a new ASTM method for hand sanitizers, E2755-10. This method allows application of a low volume inoculum (0.2 ml) from a high titer culture to the hands. The hands dry completely within the 30-second rub, preventing dilution

of the test products upon application, and allowing the sanitizers to be tested at typical use volumes. It should be noted that separate experiments using the E2755-10 method with *Serratia marcescens* have shown that the activity of rinse-off products does not change as compared to the standard hand wash method, ASTM E 1174-06 (manuscript in preparation). FDA guidelines for healthcare personnel hand washes require a minimum 2 LR after a single wash with *S. marcescens,* Product A (ABHS), was the only test product to achieve this efficacy requirement with MRSA (30). In addition, Product A and Product J (TCS hand wash) consistently achieved higher LRs *in vitro*, and performed significantly better *in vivo* than Product N (CHG hand wash). Consistent with previous findings, actual LRs on the artificially contaminated hands of human subjects were lower than those observed by Time-Kill demonstrating the limitations of *in vitro* testing. However, despite inaccuracy in predicting actual LRs, this data indicates that *in vitro* data are a useful predictor of the relative efficacy of hand hygiene products against MRSA.

The findings of this study support conclusions drawn from previous studies that show ABHS as superior to non-alcohol hand hygiene products, including CHG, for reduction of MRSA on the hands (24,31,32). It has previously been shown that a well-formulated 0.46% TCS hand wash has superior activity against MRSA than a 4% CHG hand wash (23). This observation was reproduced in the current study, where Product J (TCS hand wash) was superior to Product N (CHG hand wash). Topical products containing CHG are frequently used as part of a regimen to decolonize patients carrying MRSA in an effort to prevent MRSA infections in these patients (33-35). CHG is known to have persistent activity which increases with multiple uses, however, it appears that ABHS and TCS handwashes can be more effective than CHG for MRSA reduction after a single use. Therefore, using alcohol-based products or well-formulated TCS products should be investigated for decolonization of MRSA carriers, particularly for a single use.

In summary, the findings of this study show ABHS are a reliable hand hygiene option for the reduction of MRSA on the hands. Products with other active ingredients have variable efficacy, and should be used for the prevention of MRSA transmission only after reviewing data on the specific formulation, as non-alcohol product efficacy is both formulation and strain dependent. Additional *in vivo* research is needed to evaluate the efficacy of hand hygiene products over multiple uses, as well as to evaluate additional active ingredients. Future research should also be conducted regarding the use of an alcohol-based or TCS product for MRSA decolonization, which would provide a potential alternative to current practices utilizing CHG for MRSA decolonization. As MRSA continues to be a problem in healthcare and community environments, prevention is increasingly important, and increasing our knowledge of the role of hand hygiene for prevention of MRSA transmission is valuable.

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Potential conflict of interest. S. L. E., C. A. B, J. W. A., and D. R. M. are current or former employees of GOJO Industries, Inc. (Akron, Ohio).

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ABSTRACT

Background

A documentation tool was developed to facilitate legible, consistent documentation in a patient health record of infection prevention and control practices required for safe patient care when patients have a suspected or confirmed communicable disease or antibiotic resistant organism. This tool would ensure appropriate patient accommodation upon admission to the healthcare facility, reducing the risk of hospital associated infections.

Method

Standardized pre-printed *Infection Prevention and Control Notes* were developed for common situations requiring *Infection Prevention and Control Additional Precautions*, based on existing current standards, guidelines and best practice documents. They were placed in a patient's health record when *Additional Precautions* were required.

Results

Reductions in inappropriate patient accommodation occurred due to the presence of the *Infection Prevention and Control Notes* when patients were transferred from the emergency department to an inpatient unit. *Additional Precautions* were maintained or discontinued appropriately.

Conclusions

Infection Prevention and Control Notes became an effective tool to provide clear concise communication of required infection prevention and control practices in patient care.

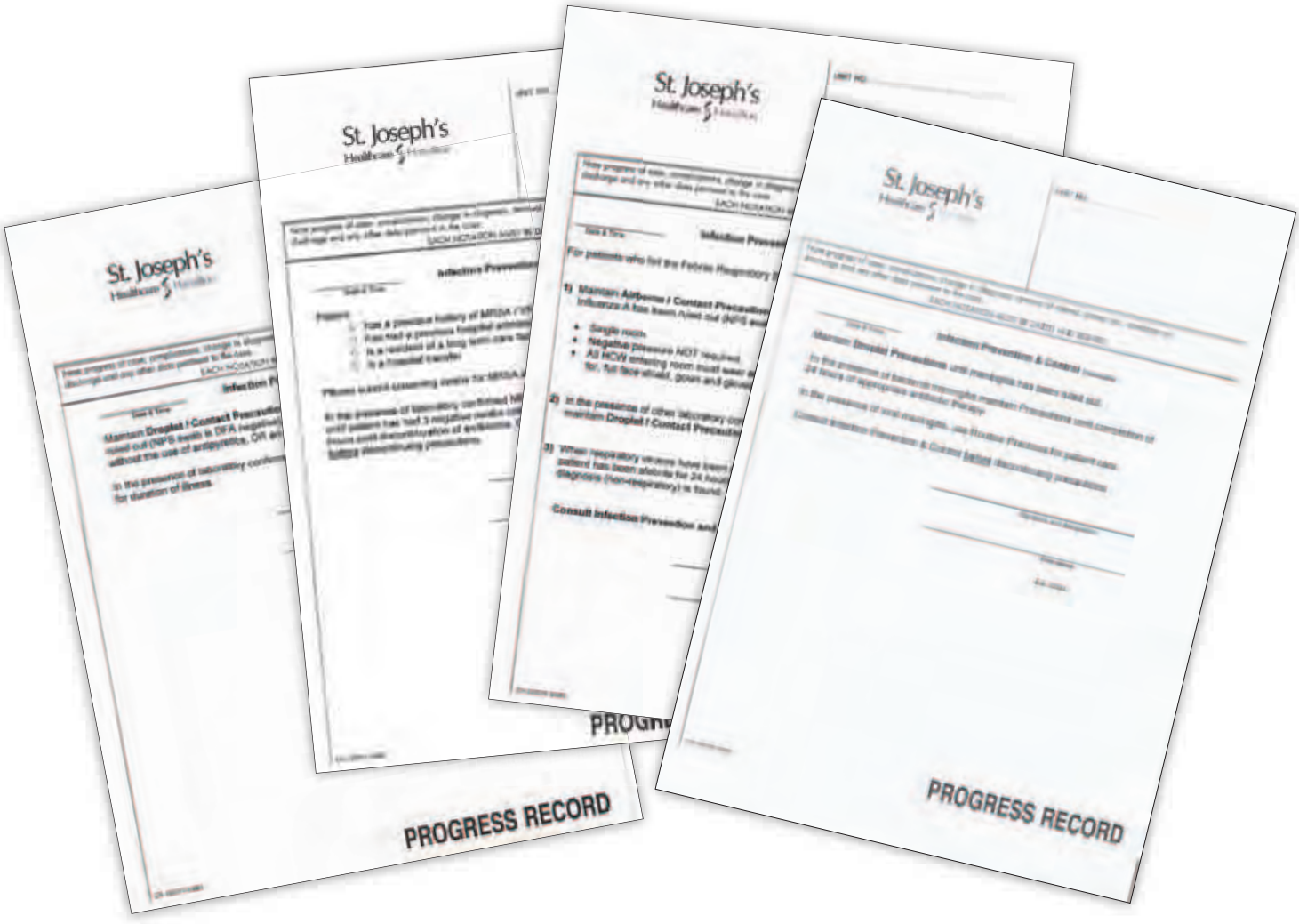
KEY WORDS
Additional precautions; hospital-associated infections

INTRODUCTION

St. Joseph's Healthcare is a tertiary care academic health facility in a large urban centre. It has one of the busiest emergency departments in the city of Hamilton, Ontario, Canada with approximately 45,000 visits and 24,000 admissions annually. In today's frenetic pace of healthcare delivery, it is of paramount importance to ensure appropriate patient accommodation upon admission to a healthcare facility. Clear, concise communication and documentation of the requirement for Additional Precautions (AP) will ensure implementation of safe patient care in the presence of a suspected or confirmed communicable disease or antibiotic-resistant organism (ARO). The risks of errors, omissions or inappropriate patient placement will also be reduced. This will decrease the risk of subsequent hospital associated infections (HAI), clusters or outbreaks of communicable diseases. With these factors in mind, a consistent method of infection prevention and control documentation in a patient health record was developed to facilitate documentation of infection prevention and control (IPAC) practices required for specific patients.

METHODS

Standardized pre-printed IPAC Notes were developed in October 2008 for common situations requiring Infection Prevention and Control Additional Precautions, based on existing current standards (5), guidelines (6) and best practice documents (1-4). The notes provided a consistent IPAC message in a legible format. These would replace infection control professionals (ICPs) handwritten individually scripted notes usually placed in a patient's health record when AP were required. Rapid documentation would be facilitated, a distinct benefit during peaks of activity due to seasonal illnesses such as Influenza and Norovirus. The notes were pre-printed on Progress Notes forms.



All notes included: a location to enter date and time, title of infection prevention and control, a line at the bottom of the note for written and printed signature of the ICP and telephone extension. The body of the note varied according to specific additional precaution requirements.

Notes were defined for internal departmental purposes as ARO screen, ARO isolate, adult respiratory, pediatric respiratory, diarrhea, rule out tuberculosis (R/O TB), and meningitis. These defined cues were typed in small font in brackets beside the note title of *Infection Prevention and Control*. Each note stated the type of precautions required in bold font, with basic rationale, recommended laboratory testing, a description of the conditions required for removal from precautions and a highlighted statement: "Consult Infection Prevention & Control before discontinuing precautions" to reduce the risk that AP would be discontinued either inappropriately or prematurely. These notes would also be adaptable to future introduction of electronic charting by using the defined note cues to produce a pre-selected standard text.

Before implementation the notes were reviewed by ICPs, and a focus group of RNs to ensure the notes would be useful to frontline health care workers (HCWs), beneficial for patient care and provided clarity of IPAC requirements for the patient.

Upon implementation, after review of a patient chart, when Additional Precautions were required, the appropriate IPAC Note would be selected by the ICP, stamped with the patient's identification card, dated, signed and placed in the patient health record providing essential documentation of IPAC requirements. Verbal communication of these IPAC requirements was also provided at that time by the ICP to the front line health care worker caring for the patient.

DISCUSSION

Positive feedback was repeatedly provided by frontline HCWs following introduction of the IPAC Notes. HCWs routinely looked for them in a patient's health record when seeking pertinent information about a patient requiring Additional Precautions. The notes were easy to locate, legible, and contained essential information that was stated clearly and succinctly. Due to the presence of the IPAC Notes in the patient health record, reductions in inappropriate patient accommodation occurred when patients were transferred from the Emergency department to an inpatient unit. Anecdotally the IPAC department experienced a significant decrease in complaints of inappropriate patient bed

assignment or failure to communicate AP status. ICPs contacted after hours on call were frequently able to refer the caller to an IPAC Note previously placed in the patient's health record ensuring Additional Precautions were maintained or discontinued appropriately.

Providing the message in legible printed form facilitated dissemination of consistent information by all ICPs. Another identified benefit was that the notes resulted in embedding some core IPAC knowledge over time among frontline HCWs. This became apparent when the frontline HCWs began to frequently inform the ICPs of patients with conditions that required AP and that the appropriate AP had already been implemented. Hand-written individually scripted notes are still required in uncommon situations that arise where a patient requires AP. Additional IPAC Notes for some less common situations have subsequently been developed. Examples include bed bugs and CJD.

Implementation of IPAC Notes has proven beneficial both to ICPs and frontline HCWs.

CONCLUSIONS

IPAC Notes are easily identifiable in the patient health record, facilitating review by the frontline HCW. Communication of a consistent message through the use of IPAC Notes resulted in increased knowledge retention by HCWs of core IPAC practice requirements. Staff routinely scan a patient chart looking for the IPAC Note to confirm requirements and conditions for sustained precautions or removal from precautions. Appropriate patient placement occurs, errors or omission of Additional Precautions have been reduced due to consistent application of Infection Prevention and Control Additional Precautions.

IPAC Notes became an effective tool to provide clear concise and effective communication and documentation of required infection prevention and control practices in patient care.

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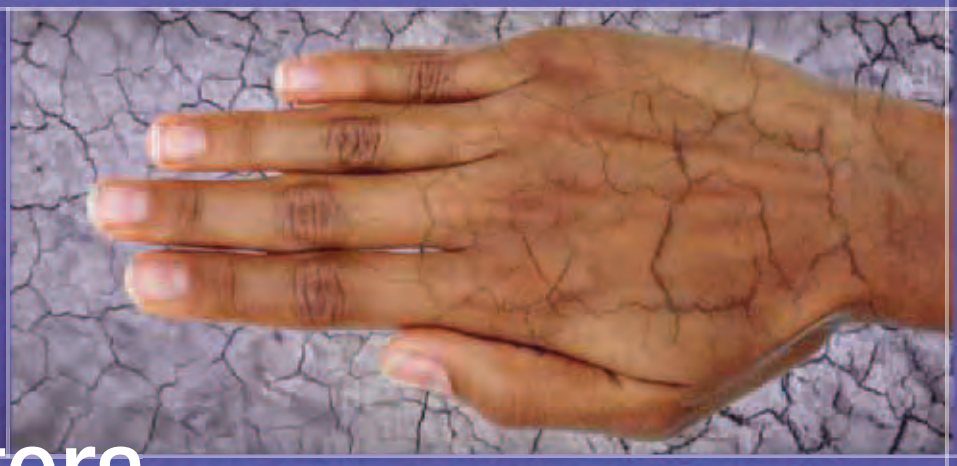

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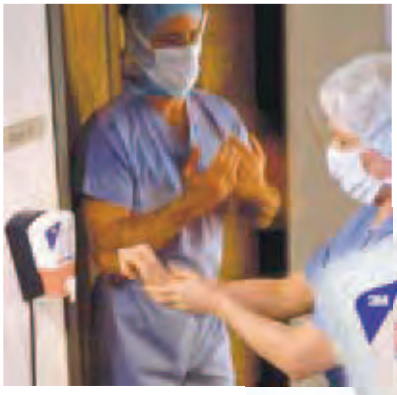

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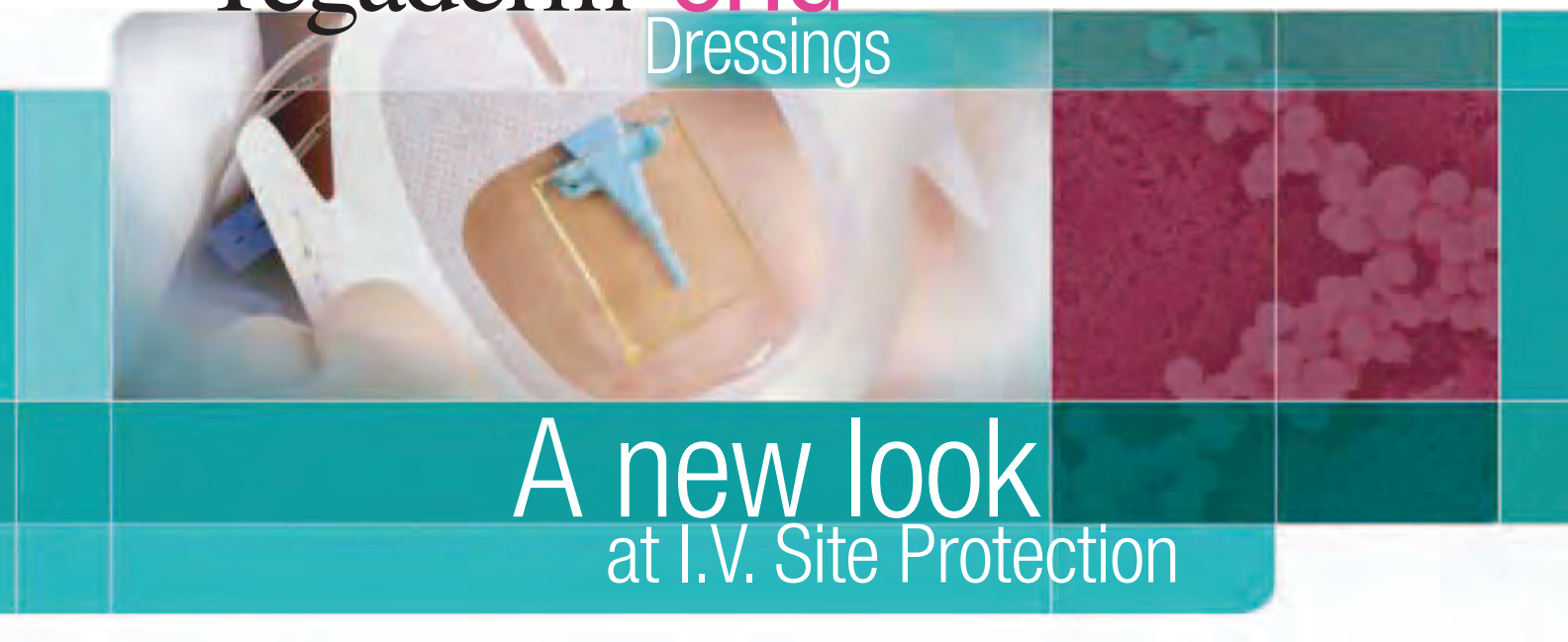

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Anne Bialachowski, RN, BN, MS, CIC
President, CHICA-Canada

If you had told infection prevention and control professionals a number of years ago about the intensity of attention that healthcare-associated infections (HAIs) would be getting from the highest levels of their organizations and beyond, they probably wouldn't have believed you. For many years IPAC professionals have struggled to get the attention for infection prevention that we felt it deserved. It is not that healthcare facilities were not interested in preventing infections. It just seemed that there were so many other demands for healthcare dollars. Now it appears that everyone is working on preventing healthcare-associated infections. The old adage " be careful what you wish for" seems very apt at the moment. This is an exciting time to be working in IPAC but it is creating some challenges for CHICA-Canada and our membership. Now everyone seems to want something from us and there are also organizations that are working on HAIs who seem to have competing agendas.

In the current crowded environment we need to ensure that important players know about CHICA-Canada and the unique skills of our members. A key responsibility in my role as president has been to sustain and nurture relationships with external partners as well as to develop new relationships. While doing this work, I have always tried to be mindful of the needs of our membership. Some of our most enduring relationships over the years have been with infection prevention societies in other countries. I have spoken of some of these relationships in previous messages. We have learned from each other and have found ways to deal with common challenges through the sharing of information and collaborating on projects. Together we can continue to elevate the profession and clearly articulate the competencies of our specialty. There are some language and cultural differences between our societies but the core competencies should be the same.

Our attention as an organization also needs to focus on other national organizations. It is our hope that the better they understand what CHICA-Canada is all about, the less likely they will be to have competing agendas and the more likely they will be to ask us to partner on initiatives. As a volunteer organization CHICA faces some real challenges in this work. We have a very small, albeit mighty, national office and rely heavily on our members, many of whom make enormous contributions of their time and expertise. As more and more organizations look to CHICA for input or assistance it challenges our ability to respond in a timely manner. On those occasions where CHICA is requested to cover expenses for our members who are contributing to the initiatives of other organizations it places a financial burden on us that is not sustainable going forward. We are very committed to shared initiatives to obliterate HAIs but we are limited in the direct monetary contributions we can make without impacting services available to our members. Communicating this message to other organizations is a bit of a balancing act. The value of our in-kind contributions must be properly packaged and marketed. This will certainly be one of many topics of discussion at our upcoming board meeting.

Thank you for the enormous privilege of representing our membership this year. You are an amazing, dedicated group of professionals that I am so very proud to be part of.

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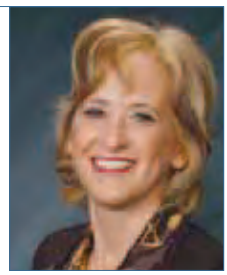

Anne Bialachowski, RN, BN, MS, CIC
Présidente, CHICA-Canada

Si vous aviez dit aux professionnels en prévention et contrôle des infections (PCI) il y a plusieurs années que les infections liées aux soins de santé se trouveraient au premier rang des préoccupations de leur organisation et d'autres instances, ils ne vous auraient probablement pas cru. Pendant de nombreuses années, les professionnels en PCI ont lutté pour que la prévention des infections reçoive l'attention qu'ils estimaient qu'elle méritait. Ce n'est pas que les établissements de soins de santé ne s'intéressaient pas à la prévention des infections, mais plutôt que d'innombrables demandes s'exerçaient sur les budgets de soins de santé. Maintenant, il semble que tout le monde travaille à la prévention des infections associées aux soins de santé. Le vieil adage « méfiez-vous de vos rêves, ils pourraient se réaliser » semble tout à fait approprié pour décrire la situation actuelle. C'est une période stimulante pour ceux qui œuvrent dans le domaine de la PCI, mais elle engendre de nombreux défis pour CHICA-Canada et pour ses membres. De nos jours, chacun semble avoir quelque chose à demander à notre association. Par ailleurs, on constate que divers organismes qui s'attardent aux infections associées aux soins de santé semblent se faire concurrence.

Dans l'environnement actuel, où les intervenants sont très nombreux, nous devons faire en sorte que les joueurs clés connaissent CHICA-Canada et l'expertise unique de ses membres. L'une de mes principales responsabilités, à titre de présidente, consiste à maintenir et à cultiver nos relations avec des partenaires externes ainsi qu'à tisser de nouvelles

The Board of Directors and staff of CHICA-Canada wish all our members and associates a very happy holiday season. It is through your support that CHICA-Canada is able to provide service to its members in the form of publications, advocacy, education and the website. We wish you every personal and professional success in 2011.

Le Conseil d'administration et le personnel de CHICA-Canada offrent à tous nos membres et associés nos meilleurs voeux à l'occasion de la période des fêtes. C'est grâce à votre appui que CHICA-Canada est en mesure de servir ses membres aux moyens du plaidoyer, de l'éducation, de ce site Web. Que l'an 2011 vous apporte des succès personnels et professionnels.

– Anne Bialachowski, RN, BN, MSc, CIC
President, Présidente 2010

relations. À cet égard, j'ai toujours tenté de garder en tête les besoins de nos membres. Les liens que nous entretenons avec des sociétés vouées à la prévention des infections dans d'autres pays comptent parmi les plus durables. J'ai parlé de certains de ces liens dans mes messages précédents. Nous avons appris les uns des autres et avons trouvé des moyens de résoudre certaines difficultés communes en partageant de l'information et collaborant à des projets. Ensemble, nous pouvons continuer d'élever notre profession et de définir clairement les compétences propres à notre spécialité. Il existe des différences linguistiques et culturelles entre nos sociétés, mais les compétences fondamentales devraient être les mêmes.

L'attention de notre organisation doit également se porter sur d'autres organismes nationaux. Nous espérons que mieux ils comprendront ce qu'est et ce que fait CHICA-Canada, moins ils risqueront de nous faire concurrence et plus ils seront portés à nous demander de devenir partenaires de leurs initiatives. Étant donné que CHICA est un organisme qui s'appuie sur le bénévolat, nous vivons des difficultés bien réelles dans l'exécution de nos tâches. Nous disposons au bureau national d'un effectif très réduit, quoique très vaillant, et comptons fortement sur nos membres, dont plusieurs nous consacrent énormément de temps et d'expertise. À l'heure où de plus en plus d'organismes se tournent vers CHICA pour obtenir de l'information ou de l'assistance, nous avons de la difficulté à répondre dans des délais opportuns. Également, quand CHICA est appelée à rembourser les dépenses des membres qui participent aux initiatives d'autres organismes, cela représente pour notre association un fardeau financier qui menace sa pérennité. Nous sommes très déterminés à participer aux initiatives conjointes visant à annihiler les infections associées aux soins de santé, mais nous sommes limités quant aux contributions pécuniaires que nous pouvons faire sans compromettre les services aux membres. Communiquer ce message à d'autres organismes constitue en quelque sorte un exercice d'équilibriste. Il importe de bien ficeler et présenter la valeur de nos contributions en nature. Ce sujet de discussion sera certainement à l'ordre du jour de notre prochaine réunion du conseil.

Je vous remercie de l'immense privilège que vous m'avez fait en me confiant le soin de vous représenter cette année. Vous, les membres, formez un groupe de professionnels formidables et dévoués. Je suis vraiment très fière d'en faire partie.

2011 ECOLAB® POSTER CONTEST

An annual poster contest is sponsored by Ecolab and supported by a chapter of CHICA-Canada to give infection prevention and control professionals (ICPs) an opportunity to put their creative talents to work in developing a poster which visualizes the Infection Control Week theme.

YOU ARE INVITED to design a poster that will be used for Infection Control Week 2011 using the following theme:

Infection Control - Are you IN?

Get INvolved, Provide INput, INitiate Change!

Prize: Waived registration to 2011 CHICA-Canada National Education Conference or $500.

REMINDER: Posters should have meaning for patients and visitors as well as all levels of staff in acute care, long term care and community settings. The poster should be simple and uncluttered, with strong visual attraction and few if any additional words.

Judging will be on overall content. Artistic talent is helpful but not necessary. The winning entry will be submitted to a graphic designer for final production. Your entry will become the property of CHICA-Canada.

25th Anniversary 1986-2011 Host Chapter: **CHICA Eastern Ontario**

Send submissions to:

Mail: Director of Programs and Projects
PO Box 46125, RPO Westdale, Winnipeg MB R3R 3S3

Fax: 204-895-9595

Email: chicacanada@mts.net

Courier: c/o CHICA-Canada
67 Bergman Crescent, Winnipeg MB R3R 1Y9

DEADLINE: January 31, 2011

Submission format:

- Electronic file in Word or PDF format only.
  or
- Paper copy not larger than 8.5" x 11".
- Include your name, address and phone number on the covering email or on the back of your entry.

CHICA-CANADA

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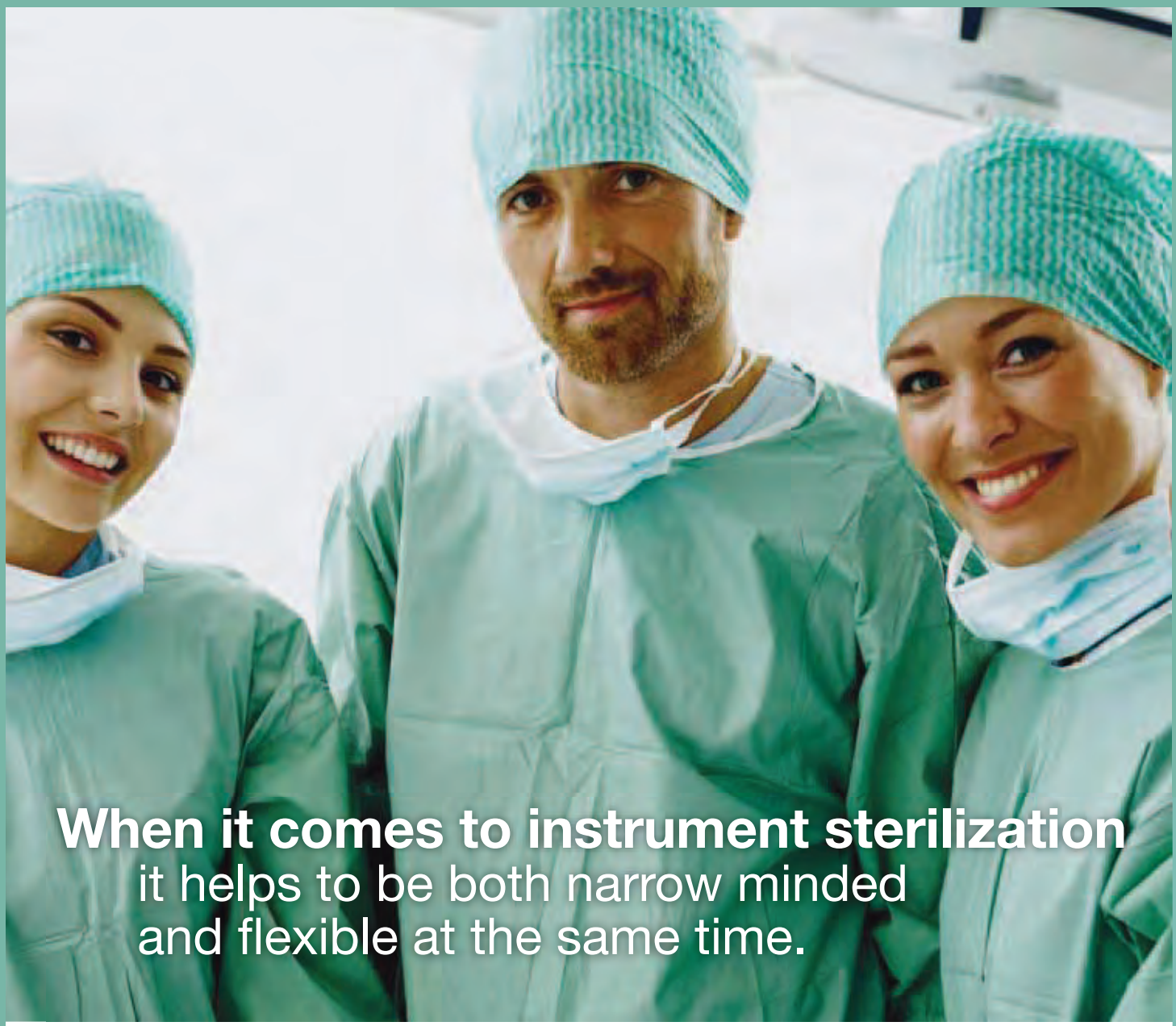

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Ladies and gentlemen: your board of directors

Gerry Hansen, BA
Executive Director, CHICA-Canada

The results are in for the 2011 board of directors. Jim Gauthier has been elected to the position of President-elect. He and the current leadership team will add tremendously to CHICA's strong future.

Cathy Munford may leave the board table at the end of this year but she is already immersed into her next important role, that of Chair of the 2011 National Education Conference. Cathy has worked tirelessly during her three years in national office and has left her mark in the cohesiveness of this working board. 2010 President Anne Bialachowski has taken the profile of CHICA-Canada to another level, forging valuable relationships amongst other infection prevention and control associations and the external stakeholders with whom we work so closely. Donna Wiens steps into the helm of CHICA as 2011 president. Donna has already had an impact with her keen insight into the board relationship with chapters and interest groups.

Bern Hankinson will retire from her position as secretary/membership director. Bern is a steadfast sounding board with pragmatic answers to the problems that we encounter in developing new membership communities and maintaining our existing membership roster. Her successor will be Marilyn Weinmaster who also brings a thoughtful approach to her responsibilities.

CHICA at APIC, New Orleans, July 2010: Isabelle Langman, Anne Bialachowski, Pat Piaskowski, Gerry Hansen (and the famous New Orleans beignets).

The returning board members will continue to support CHICA membership in various roles. Judi Linden is our director of finance extraordinaire, always seeking to reconcile CHICA's emerging national and international role with the impact of healthcare budgets on membership and the board. Dr. Michael Gardam has been the media face of infection prevention and control and is an expert spokesperson. Dr. Jennifer Grant continues in the vital and busy role of director of standards and guidelines. Karen Clinker is admirable in the position of director of programs & projects, marketing and increasing CHICA's profile. It is that committee which initiated the massive renewal of the CHICA-Canada Audit Toolkit.

Dr. Donna Moralejo is welcomed back for a second term as director of education. The extraordinary work by Dr. Moralejo and her committees has been in the delivery of the CHICA-Canada Basic Infection Prevention and Control Distance Education Program, and the endorsement of other institutions which deliver a basic IP&C course.

Often in the background but integral to the continual growth of CHICA-Canada are those contracted and appointed persons without whom we would not be able to carry on in an efficient and effective manner. To be commended for their support of CHICA are Kelli Wagner, Administrative Assistant; Shirley McDonald, Web Communication Manager; Pamela Chalmers, Web Designer; Karen Dobbin-Williams, Distance Education Coordinator; and Pat Piaskowski, Clinical Editor. CHICA-Canada thanks all of you.

To CHICA-Canada members, we thank you most especially and wish you every success in 2011.

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SHARING EXPERTISE

CHICA board of directors **election results**

The following have been elected to the board of directors of CHICA-Canada for terms commencing January 1, 2011:

JIM GAUTHIER, MLT, CIC

President-elect

Jim Gauthier, MLT, CIC is an infection control practitioner at Providence Care in Kingston, Ontario. He has held that position for 11 years and has been a CHICA-Canada member for 21 years. His responsibilities are day-to-day infection control practice with 2.5 other FTE. His responsibilities include surveillance, presenting education, developing and updating policies and outbreak control. He also acts as a resource for a long-term care facility and other ICPs across Canada.

He has lectured locally, provincially, nationally and internationally both live and through teleconferences. He has presented to schools, dental offices, funeral personnel, home care, public health staff and industry (both medical and non-medical).

Mr. Gauthier has been a member of the CHICA-Canada National Scientific Program Committee since 2006, having most recently held the position of Scientific Program Chair of the CHICA-Canada 2010 National Education Conference. He was the lead in development of both the Long Term Care and Mental Health Interest Groups. He has board experience as Technologist Representative (1992-1994). Currently, he is Manager of the CHICA Connections discussion board at *www.chica.org*.

Mr. Gauthier holds a diploma in Medical Laboratory Technology (1980, Mohawk College), and Certification in Infection Control (2005 recertification).

Philosophy: I have been a strong advocate for infection control in all healthcare settings for over 20 years. I believe CHICA-Canada is at the forefront of infection control, and is becoming well recognized world-wide as a leader in this field. The members ARE CHICA-Canada, and each and every member brings new strength to the organization. Every CHICA-Canada member should be proud to belong to such a vibrant and forward-looking organization. I will help guide CHICA-Canada to meet its Vision Statement, and I will make sure, by the end of my three years, that the five major goals set in our 2010-2015 Strategic Plan are met, or well on the way to being met. I like to think I live all of CHICA-Canada's Value Statements, and I would represent these values locally, nationally, and internationally.

MARILYN WEINMASTER, RN, BScN, CIC

Secretary/Membership Director

Marilyn Weinmaster, RN, BSCN, CIC has been an infection control practitioner at Wascana Rehabilitation Centre, Regina Qu'Appelle Health Region, holding full-time and part-time positions since 2000. She has been a CHICA-Canada member since 1996 and is a past president of CHICA-Canada chapter, CHICA SASKPIC. At Wascana, Ms. Weinmaster is responsible for the Infection Prevention and Control Program in Long Term Care, Complex Care, Adult and Child Rehabilitation, and outpatient therapy departments. Ms. Weinmaster received her nursing diploma from SIAST, Regina; her BScN from the University of Saskatchewan, Saskatoon; and her CIC in 2007 after taking the Infection Control Course at Centennial College. She is currently the Long Term Care Representative on the 2011/2012 Scientific Program Committees, and is co-Chair of the CHICA-Canada Long Term Care Interest Group.

Philosophy: In 1997 I attended my first CHICA conference as a novice infection control practitioner. I recall my first impressions were of a group of dedicated, knowledgeable, passionate professionals in infection control. These qualities remain today, strengthened by challenges facing infection control professionals and the national organization. Membership in CHICA and its chapters provides an invaluable resource for infection prevention and control professionals. I am proud to be associated with a profession that is willing to share expertise, support and mentor colleagues in all practice settings. I value the networking and mentoring that has been and continues to be of great assistance to me. I believe it is important to give back to the organization that has supported me through the years. I am honoured to have been elected for the position of Secretary/Membership Director. I look forward to the challenge, professional, and personal growth by contributing to the work of CHICA over the next three years. I will work with the board to explore opportunities to promote and expand membership.

DONNA MORALEJO, RN, PhD

Director of Education

Donna Moralejo, RN, PhD is the current CHICA-Canada Director of Education. She has been an assistant professor in the Memorial University School of Nursing, St. John's since 1990. Her responsibilities

and interests are teaching in the School of Nursing undergraduate and graduate programs (classroom, by distance); supervision of master's students' projects; research (focus on surveillance, infection prevention and control, evidence-based practice, evaluation); and community service (e.g., projects, committees). Her service to CHICA-Canada has included participation in Public Health Agency of Canada Infection Control Guidelines Steering Committee and Working Groups. In addition, she was a member of the Advisory Committee that developed the CHICA-Canada Entry to Practice Distance Education Program that was launched in 2005 and initially offered through the University of Calgary. She has also chaired the Education Endorsement Review Committee, which reviews Basic Infection Prevention and Control Programs for Novice ICPs after their application for endorsement by CHICA-Canada. Dr. Moralejo received her education at McGill University (BSc in microbiology and immunology, BA in History and MSc(A) in Nursing). She obtained a PhD in epidemiology through the University of Calgary.

An Award for Excellence in Nursing Education was received from the Association of Registered Nurses of Newfoundland and Labrador. A past president of CHICA Newfoundland Labrador, Dr. Moralejo has been the CHICA-Canada Director of Education since 2008. She was chair of the National Conference Scientific Program Committee in 2002 and 2009, and co-chair in 2007 and 2008.

Philosophy: My philosophy about education reflects CHICA-Canada's new strategic plan. Educational opportunities need to be made available to all practitioners, regardless of their geographic or practice setting, level of experience, or ability to attend the National Education Conference. Furthermore, it is important to facilitate interaction between members, and between members and other experts, so individuals can learn from each other, share tools, and collaborate in problem-solving and developing evidence-based programs and policies.

I look forward to a second term in order to work with CHICA members and committees to begin to achieve the goals identified in the strategic plan, including but not limited to, identifying priority learning needs of members, facilitating a variety of learning opportunities, and sharing teaching tools. CHICA-Canada can help create and strengthen infrastructure for education and communication, so as to strengthen the practice of infection prevention and control in all parts of the country.

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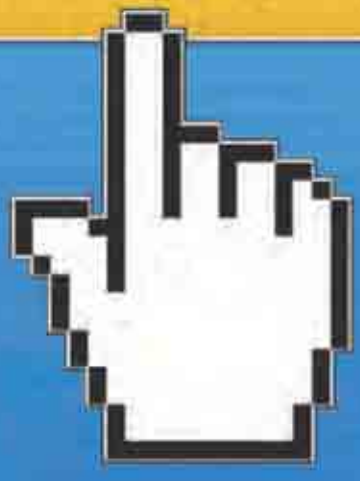

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The Public Health Agency of Canada and CHICA: **Strengthening collaboration on infection prevention and control**

In the summer of 2010, PHAC's Centre for Communicable Diseases and Infection Control (CCDIC) and CHICA representatives discussed opportunities for collaboration on infection prevention and control (IPC) activities in Canada. Plans for ongoing communication have been established, including regular PHAC IPC updates in the Canadian Journal of Infection Control.

Within PHAC, CCDIC is responsible for creating and sharing credible knowledge and facilitating coherent, national action which contributes to the prevention and control of communicable diseases for all Canadians, with a focus on key populations at risk. To this end, the Centre's Canadian Nosocomial Infection Surveillance Program (CNISP) and the Infection Prevention and Control Program (IPCP) undertake surveillance and knowledge translation and exchange activities to complement and support provincial/territorial and stakeholder efforts to address healthcare-associated infections (HAI) and infections caused by antimicrobial-resistant organisms.

Examples of recent CCDIC IPC activities include:

- CNISP meeting in November 2010: recent national HAI surveillance results were discussed, and priorities for new projects identified.
- Stakeholder consultation with CHICA and other professional organizations, prior to the release of two comprehensive IPC guidelines: Hand Hygiene (HH), and Routine Practice and Additional Precautions (RPAP)
- Collaboration with CHICA to develop RPAP Educational Tools
- Development of shorter focused documents (Infection Prevention and Control Measures for Healthcare Workers in All Healthcare Settings) in response to emerging issues such as Carbapenem-resistant Gram-negative Bacilli (CRGNB) and IPC guidance for Seasonal Influenza
- PHAC has partnered with numerous organizations, including CHICA, on a range of activities to mark the first Antibiotic Awareness Day in Canada (November 18, 2010).
- Involvement in international HAI forums. PHAC is working with the World Health Organization (WHO) to establish a Global Infection Prevention and Control Network that will have a primary focus on improving healthcare associated outbreak response in low resource countries.
- February 2011 PHAC IPC Steering Committee meeting will include dialogue with provincial and territorial partners and strengthen collaboration with First Nations and Inuit IPC programs. CHICA will be represented at this meeting.
- Ongoing publication and presentation of Infection Prevention and Control Research activities, including national surveillance findings (CNISP) and IPC interventions to improve HAI outcomes.

Addressing healthcare-associated infections in Canada requires strong collaborative relationships and PHAC is looking forward to working closely with CHICA on a variety of initiatives over the coming months.

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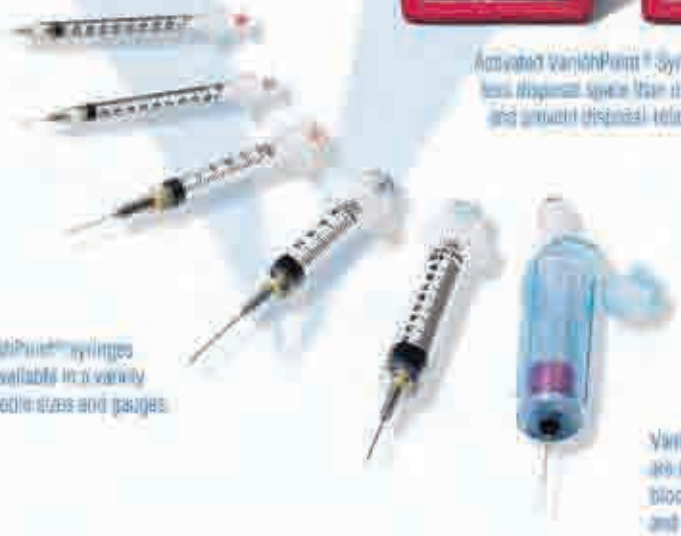

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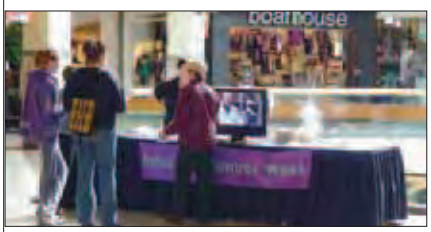
Snapshots of **National Infection Control Week 2010**

Here are samples of some of the creative activities CHICA-Canada members organized in their institutions for NICW. **Congratulations to everyone!** It was a fabulous and effective week!

Quinte Mall Display, Belleville



Cataraqui Towne Centre, Kingston

Cataraqui Towne Centre, Kingston

CHICA Eastern Ontario hosted successful information displays at the Cataraqui Towne Centre in Kingston and the Quinte Mall in Belleville on October 16-17, 2010. Our new poster, created as a result of our chapter poster contest, welcomed the public to our display tables.

We offered information on hand hygiene, influenza immunization including community clinic schedules, as well as other infection prevention and control topics. Why Don't We Do It In Our Sleeve or the CHICA Sudsy DVDs played continuously. These were both hot topics and well received. Local children delighted in the colouring pages of bugs and hands. Free samples of hand sanitizer, wipes, buttons, and cards with the CHICA.org. logo, calendars, posters, and printed materials were given out. Items were donated by our local health units, Loyalist College, Regional Infection Control Network, Quinte Health Care, and corporate sponsors.

The public was encouraged to enter our draws and many visited the booths during the two days. A total of eight door prizes were given away. This was truly a cooperative effort among our chapter and corporate members. Interest was high and the kick-off to NICW was a success!

We would like to thank all who donated door prizes and items to give to the public. A special thank-you to Ecolab who donated an automatic hand hygiene station and a tabletop dispenser for the event, which we may keep for the chapter. A draw will be held at our next meeting and the dispensers will be given to a chapter member for use in their facility.

From Amanda Gauthier, RN, BScN,
Lady Dunn Health Centre, Wawa, Ontario

OAHPP Northeastern Ontario Infection Control Network

We held an Infection Control Week Simple Plan: Best Infection Control Week contest among the ICPs and departments for all healthcare sectors. Entrants sent us a message describing their plans for IC week, then followed up by sending pictures of activities, their bulletin boards, handouts, posters, anything else created for the event(s).

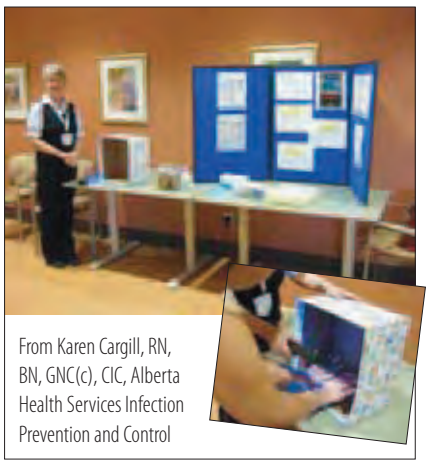
I collated and printed the materials without identification of origin. Our judge chose Lorraine Melanson's entry on behalf of the IPAC department at the Timmins and District Hospital. This entry was chosen because the IPAC team partnered with other departments such as environmental services, engaged staff where they were by taking NICW activities to the work areas and the cafeteria, and running several engaging, interactive events.

Prizes were provided by NEOICN. Timmins Hospital IPAC Department chose as their prize a copy of the APIC Text 3rd Edition. All other entrants received a prize pack of IPAC items from the NEOICN.

Kyla Van Dusen, RN, BScN - The Scarborough Hospital

We hosted an infection control booth, complete with posters on hand hygiene created by staff, and many prizes to be won. Staff answered infection control questions and got a chance to spin the wheel for a prize. Prizes of personal hand sanitizer, lotions, loot bags of treats, and two grand prize baskets full of hand hygiene goodies.

We had two contests for staff to participate in: 1. Submit a completed hand hygiene quiz correctly and be entered into a draw for a chance to win an iPod. 2. Create a poster (one per unit) and be entered to win a food voucher for the unit (worth $200). The feedback was great; many people came out to our booth and participated in the contests.



From Karen Cargill, RN, BN, GNC(c), CIC, Alberta Health Services Infection Prevention and Control

Continued on page 257

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*Data on file at Excelsior Medical Corporation

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Louise Venne, RN, B.Sc.N -
West Nipissing General Hospital

We created an easel display board in the nursing dept. demonstrating concrete examples of aseptic procedures and reminding staff to wash hands just prior to doing these. It was well received by staff and we are hoping to see an improvement at next audit.

We also start immunizing staff against influenza and enticing them with Halloween treats. Here is our influenza target poster displayed on my door (created by Debbie Edmunds, RPN). Our target rate is 90%. I change the data regularly so staff can see the weekly progress in our influenza compliance rate.

Pine Meadow Nursing Home, Northbrook Ontario

We involved staff and residents during NICW. On the Infection Control Board, tips on infection prevention and control were posted for staff. Staff submitted their own tips to a manager and received a prize. Education on the upcoming influenza session was also provided.

Residents participated in hand hygiene with Mallory, Activity Director and Elizabeth, Director of Care/ICP, prior to activities such as Coffee and News Club. Our annual influenza vaccine was also initiated on for staff, residents and volunteers.

Jaimee Elmore, RN, BScN -
Blind River District Health Centre

My hand hygiene tree was a success as it got people thinking about when to perform hand hygiene. Individuals signed a fall hand leaf to mark their commitment to hand hygiene and placed it on the tree. Acceptance was good.

I reviewed the proper method for donning and doffing PPE. We now use disposable gowns and are switching to washable. Staff now remove gowns by tearing the front to bust the ties and removing gown and gloves in one motion. Moving to washable means they can no longer do this safely. Everyone wanted to untie the gown first, so I added another component. After donning I had them pretend to perform hand hygiene with purple paint; this served two things, to see spots they missed routinely (staff was surprised by this) and then to represent germs. This helped a lot. We then covered some questions from the website in relation to routine practices, MRSA, and influenza transmission and prevention.

Tracy Haley - Niagara Region Public Health

We created a display for our week-long roadshow. The Health Promoter in Environmental Health and I (Health Promoter for Infectious Disease) traveled to all of our public health locations. We had seven posters depicting different times when one should remember to clean their hands and environment. The posters now hang in strategic locations throughout our offices. We also created a banner using the graphic from the CHICA website. This was very helpful to get our It's Simple message across, and it will be used at future Clinical Services/Environmental Health events.

We updated the educational and promotion materials at each location, and provided a personal ABHR container and spoke about the importance of cleaning the work environment and hands. We placed a survey on our intranet site asking all employees to take part in the Infection Control Challenge for the chance to win a $100 Keg gift certificate. We had an overwhelming number respond. Our message and concept was simple, collaborative and long lasting. Hopefully the posters, banner and the personal ABHR container will have an impact and remind staff of the simple steps in infection control.

Cheryl Collins, RN, BScN, CIC , Macassa/Wentworth Lodges - City of Hamilton

As per the CHICA theme Keep It Simple, we focused on the simplest thing we can all do to prevent the spread of infection – hand hygiene. We put up a display board and assembled a "Clean Tree" with the logo We Care – We Wash Our Hands and encouraged all staff, visitors, and residents to sign a handprint cut-out to show they are dedicated to increasing their hand hygiene in our home. We then used the signed handprints to draw prizes for infection control-related prizes such as personal-sized hand sanitizers.

Continued on page 259

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Lorraine Melanson - Timmins & District Hospital

We were fortunate to partner with our Aramark housekeeping department to highlight NICW. We celebrated by putting up a display board on the hospital main floor (geared for the general public). It focused on hand hygiene, cough etiquette, influenza information, and guidelines for visitors. We also offered free hand sanitizer wipes and candy.

A second display was set up by the cafeteria for staff. It featured information on Additional Precautions and a contest called The Face Behind the Mask. Staff had to guess the name of the employee wearing PPE, and the person with the most correct answers won a prize. Free hand-outs included the RICN Infection Prevention & Control pocket guide and hand sanitizer wipes.

We hosted a PPE Challenge, where staff had to demonstrate proper donning and doffing of PPE for a selection of Additional Precautions (contact, droplet, airborne, or enhanced droplet). Our travelling PPE cart was decorated and participating staff entered their name for a prize draw.

We also reached out to physicians by bringing a display to the doctors' lounge, featuring hand washing information, hand sanitizer wipes, and candies.

Sharon O'Grady - Bridgepoint Health, Toronto

We used Canadian Patient Safety Week to highlight the importance of infection prevention and control in providing a safe environment. One of the fun activities was to challenge staff on the units to an equipment sanitization relay. Each team was asked to clean four pieces of patient care equipment: thermometer, commode chair, BP machine, and keyboard. Each participant had one minute to wipe down their item. When finished, an ultraviolet light was used to see if any fluorescent dye remained.

The photo shows Shekoon Zane (R) competing against Tsering Lhazom while organizers Linda Shi (L) and Allison Arnott look on.

Joanne "The Germ" Archer, from PICNet-BC, celebrates IC Week at University Hospital of Northern BC.

From Kathie McGhie, 3M Canada

From Andrea Skeoch, RN Temiskaming & District Hospital, New Liskeard, Ontario

From Josette Charles N, B.Sc.M.Ed
CHSLD Juif de Montréal/
Jewish Eldercare Montréal

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CHICA-HANDIC **Chapter updates and activities**

CHICA-HANDIC is one of the oldest CHICA-Canada chapters. We'd like to share some of our events and activities with you.

Showcasing our new logo

Upon reviewing our website and logo, we decided to update both, beginning with the logo. A contest was held with the above displayed result. The winner of our logo contest was **Cheryl Collins**, an ICP from Macassa Lodge in Hamilton. Cheryl's contribution was acknowledged at our annual educational day by way of an honourarium and certificate.

3M Award event

Our chapter was delighted to be recipients of the 2009 3M Award at the CHICA-Canada National Education Conference in Newfoundland. On February 4, 2010 our members enjoyed a presentation about applying an eight-step process for creativity by **Dr. Min Basadur**, followed by appetizers and samples of wine and a tour of the Legends Winery. To learn more about applied creativity, see *www.basadur.com*.

All In the Family Infection Control Through the Lifespan

Over 375 healthcare workers attended our 14th annual educational day on June 17, 2010 themed to the *Year of the Family*. Topic titles included Food for Thought and Something is Wrong with my Gut; IPAC Horrors in the Home; Skeletons in the Closet and Lizards in the Living Room; Blood-Letting and Other Miraculous Fads; Different Strokes for Different Folks; and Bed-bugs And That's Not Your Pillow You're Cuddling. We also learned about positive deviance and were treated to a hilarious review of wonderful IPAC tools by an experienced ICP and a novice ICP. The CHICA-HANDIC annual conference is always well anticipated and attended and is all supported by various vendors.

HYGEIA Award

This award was first established in 2008 and is based on the following criteria:

- Promotion and appreciation for, and awareness of, the field of IPAC [Earth]
- Creativity and innovation [Water]
- Enthusiasm for the field of IPAC [Fire]
- Communication [Air]
- Excellence in performance [Star Quality]

The second recipient of this award is **May Griffiths-Turner**, an ICP at St. Joseph's Health Care in Hamilton who received the HYGEIA plaque at the June 17 educational day. See our chapter website for more details about this award.

The Out-of-the-Box Award

Founded by a retired ICP practitioner, **Diane Thornley**, upon her retirement, this award recognizes outstanding creativity in the management and resolution of a particular infection prevention and control issue or in the development and initiation of an innovative or ingenious educational project. As this award and process is newly launched, and will be awarded at our next chapter meeting, we will certainly share the outcomes with you in our next journal submission.

May-Griffiths Turner (right), receives the HYGIEA Award from Chapter President, Risa Cashmore at the CHICA-HANDIC Annual Educational Day June 17, 2010.

The current practice of infection prevention as demonstrated by the practice analysis survey of the Certification Board of Infection Control and Epidemiology, Inc.

Fran Feltovich, MBA, RN, CIC, CPHQ, 2010 CBIC President
Lawrence Fabrey, PhD, Senior Vice President, Psychometrician, Applied Measurement Professionals, Inc.

The Certification Board of Infection Control and Epidemiology, Inc. (CBIC) is a voluntary, autonomous board that provides direction for and administers the certification process for infection prevention (IP) professionals. The CBIC performs a practice analysis (PA) survey approximately every five years to assess the current practice of infection prevention and ensure the certification examination focuses on current IP practice. A practice analysis is the process of systematically collecting information that describes activities performed by individuals of a specific job. Each CBIC PA survey builds on previous CBIC PA surveys to identify the current responsibilities of the IP professional. The results of the survey are used to develop the test specifications for the certification examination. The practice analysis is a key component of an ongoing examination development process as depicted in Figure 1.

Although the last PA survey was conducted in 2005 (1), significant changes have occurred in the practice of infection prevention during the past few years. To ensure the certification examination reflects current infection prevention practice, the CBIC made the decision to conduct the PA survey in 2009 instead of 2010.

Figure 2 2009 CBIC Practice Analysis Task Force

Fran Feltovich, RN, MBA, CIC, CPHQ, 2009 CBIC President-elect, Chair, Houston, Texas
Marie Kassai, RN, BSN, MPH, CIC, West Paterson, New Jersey
Sharon Krystofiak, MS, MT (ASCP), CIC, 2009 CBIC President, Pittsburgh, Pennsylvania
Terrie Lee, RN, MS, MPH, CIC, 2009 CBIC Test Committee Chair, Charleston, West Virginia
Kathryn McGhie, RN, CIC, CBIC Director, London, Ontario, Canada
Kit Reed, RN, BSN, MPH, CIC, Charleston, West Virginia
Barbara Russell, RN, BSHA, MPH, CIC, CBIC Director, Miramar, Florida
Kathryn Suh, MD, FRCPC, CIC, CBIC Director, Ottawa, Ontario, Canada
Rita Tjoelker, RN, MS, CNS, CIC, CBIC Director, Portland, Oregon
Sister Bernadette Washy, CR, MS, CIC, Pittsburgh, Pennsylvania
Sharon Williamson, RN, CIC, Dallas, Texas

To facilitate the PA process, the CBIC appointed a Practice Analysis Task Force to serve as the Advisory Committee. The responsibilities of the Task Force included: 1) development of the PA survey, 2) determination of the sample to be surveyed, 3) review and analysis of the responses, 4) determination of test specifications for the certification examination, and 5) review and revision of the certification examination content outline.

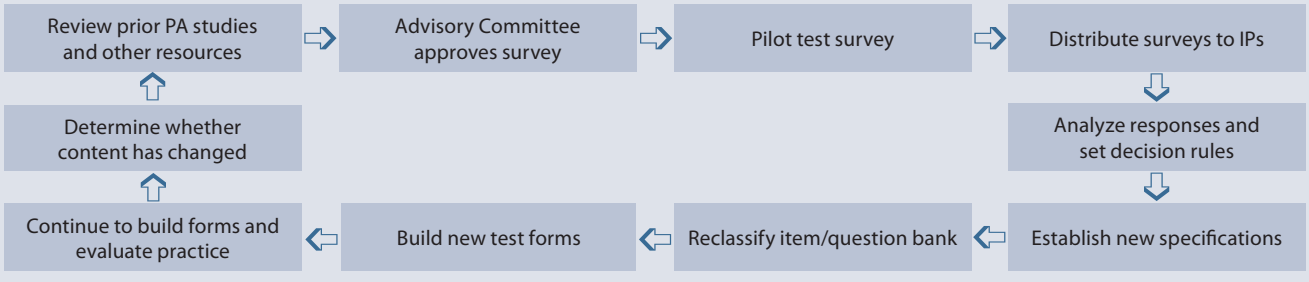
The Task Force membership (Figure 2) included IPs with varied tenure in the infection prevention profession and from varied geographical locations in the United States and Canada. They were members of the CBIC and other certified IP professionals.

METHODS

The CBIC requested the services of Applied Measurement Professionals, Inc. (AMP), Psychometrics Division to provide technical assistance in developing and administering the survey and analyzing the findings. Lawrence J. Fabrey, PhD, AMP Senior Vice President, served as lead for the AMP team.

The PA process involved two phases. The first phase focused on developing the survey instrument, piloting the survey among IPs with varied tenure in the profession (from 2.5 years to more than 25 years), and then distributing the survey to a sample of IPs working in multiple healthcare settings in the United States,

Figure 1 Cycle for CBIC practice analysis and examination development



Canada and other countries. For purposes of the survey, the term infection prevention and control professional (ICP) was used instead of IP. An ICP was defined as one who is responsible for the: 1) planning, implementation, and evaluation of infection prevention and control measures; 2) collection, analysis, and interpretation of epidemiologic data relative to infections; and 3) investigation and surveillance of suspected infection outbreaks.

The second phase of the PA process focused on analyzing the results, developing the test specifications, and reviewing and revising the detailed content outline to reflect the results of the PA survey. Both phases of the PA process were successfully implemented with members of the Task Force working collaboratively with the AMP team.

Survey development

Task Force members reviewed background information regarding the practice analysis process and its relationship to the examination development process, the role of the CBIC in the development of a certification examination for IPs, and materials used by the CBIC in the previous PA. During a meeting of the Task Force on January 24, 2009, the existing task list was thoroughly discussed and tasks representing individual job responsibilities were modified, added, and removed resulting in a list of tasks that was dramatically different from the previous survey. The list was organized within seven content domains under which 76 tasks were categorized into subcategories. The Task Force approved a rating scale that allowed survey respondents to indicate that the task was or was not necessary for the job and if it was necessary the task could be rated on a four-point scale ranging from minimally significant to extremely significant. In addition, 23 relevant demographic questions were approved. Some questions addressed characteristics of the respondent, such as years in infection prevention and control, years in any healthcare setting, gender, race, and age. Other demographic questions addressed the respondent's practice, such as geographic region of employment, primary employment setting, the facility's bed capacity, number of annual outpatient visits, and number of full time ICPs in the facility. Demographic questions were included in the survey to both provide descriptive information about the respondents and for some demographic questions, help ensure that individuals from different subgroups view the tasks required of the ICP exceed a level of importance sufficient to warrant inclusion on an examination used in the United States and Canada.

Following the meeting of the Task Force, the survey was distributed as a pilot test to the Task Force, the entire CBIC Board, and other individual content experts. An effort was made to solicit input on the pilot test from novice IPs, i.e. those with five years or less experience as well as those with broad knowledge and experience in infection prevention. Following a review of the comments from the pilot test, the survey was finalized for distribution to the sample.

Sampling plan and survey distribution

The Task Force considered various methods of identifying IPs for the sampling plan. Ultimately, an attempt was made to reach the entire population of IPs by taking a 100 percent sample from the membership of three major infection prevention organizations. Invitational e-mails containing a link to the online practice analysis survey were distributed to IPs listed in the CBIC database, as well as the two professional organizations for IPs in North America: the Association for Professionals in Infection Control and Epidemiology (APIC), and the Community and Hospital Infection Control Association-Canada (CHICA-Canada). Currently certified individuals in the CBIC database were thought to be the most critical group to be sampled, but the Task Force wanted to ensure the valuable input from non-certified IPs. Lists that included 4,346 names from CBIC, 11,107 names from APIC and 1,727 names from CHICA-Canada were merged and duplicate entries were purged. A total of 17,180 e-mail addresses were initially available and following removal of duplications, 15,058 were used as the sample.

A link to the final survey was distributed via email on April 15, 2009 to the sample, with a message that emphasized the purpose of the survey and the importance of receiving a response from actively practicing IPs. In addition, potential respondents were informed that those who completed the survey prior to the May 11 deadline would be eligible for a random drawing for a gift card. A follow-up message was sent to the sample on April 30, thanking those individuals who had already completed the survey and reminding those who had not completed the survey about the importance of their participation.

RESULTS

Of the 15,058 survey invitations that were distributed, 1,346 were returned undeliverable, and 15 individuals opted out of the study. Therefore, the potential number of respondents was 13,697. A total of 4,147 responses were received but 376 were removed from the data set due to insufficient responses or duplicate surveys. Therefore, 3,771 completed surveys were available for analysis, resulting in a corrected response rate of 27.53%.

Demographic information

The demographic characteristics of the respondents who were removed from the data set were reviewed and no obvious differences were noted compared to the 3,771 valid respondents. The Task Force concluded that the respondent group demographic characteristics were as expected and judged to be representative of the population of IPs. In addition, the Task Force concluded that the respondent group consisted of a sufficient number of responses in relevant subgroups for subsequent analysis.

Table 1 shows summary statistics of the age of the respondent, their years of experience in any health care setting, and their years of experience as an IP. All distributions are negatively skewed, especially for years as an IP.

A total of 3,332 responses were received from IPs practicing in the United States (US), 374 from Canada, and 54 from other countries. Responses were

Table 1 Years in IP, healthcare, and respondent age

Variable	n	Mean	s.d.	Median	Mode
Years in infection prevention and control	3743	10.05	8.80	6.50	2
Years in any healthcare setting	3738	25.78	10.27	27.00	30
Respondents age in years	3637	50.67	9.13	51.41	54

received from every US state and Canadian province. Overall, the majority of respondents (86.6%) reported working in an acute care environment. More than a third of the survey respondents (37.6%) were from facilities with greater than 10,000 visits/procedures per year and the bed capacity of the facility varied among respondents, with most (20.4%) having 101 to 200 beds.

Almost half of the respondents (48.0%) were certified in infection control as a CIC® and the majority of respondents (44.2%) reported that CIC® is not required but preferred at their facility. The professional background of a majority of respondents (81.2%) was as a registered nurse, nearly half of the respondents (45.5%) held a baccalaureate degree as their highest level of education and 27% held a masters degree. The gender of the respondent group was primarily female (93.5%). The majority of respondents (84.4%) classified themselves as White Non-Hispanic, using the groupings suggested by the US Census Bureau and modified by the Task Force.

Adequacy of the instrument

In response to the question following the task list: "How well did this section cover the critical tasks for the role of the Infection Prevention and Control Professional?" 55.5% indicated "completely," 43.9% indicated "adequately" (for a total of 99.4%). Only 22 respondents indicated the task list on the survey was "inadequate." Another aspect of the adequacy of the instrument relates to its reliability. Two aspects of reliability were estimated. Task reliability estimates show to what extent each scale "hangs together" and the Coefficient Alpha reliability among tasks for each of the seven domains ranged from .82 (for the first domain, with seven tasks) to .94 (for the second domain, with 30 tasks). The relatively high level of task reliability indicates that the domains each represent a consistent collection of tasks. Rater reliability estimates are more important in survey research, since they indicate the degree to which respondents agree on the importance of each task. Again calculated within the domains, intraclass correlation coefficients for each domain were at least .99 based on all respondents with complete ratings within a domain.

Task ratings

Descriptive data for each of the 76 tasks were calculated and then evaluated by the Task Force. Firstly, the number of ratings representing "not necessary for the job" was tallied. Secondly, a mean rating was calculated using the four-point scale ranging from minimally significant to extremely significant. The mean level of significance judged by the respondents who believe that the task is necessary to practice ranged from 2.22 for task 25 ("Use advanced statistical techniques to describe data (e.g., z-score, Chi-square, odds ratio)") to 3.86 for task 40 ("Identify and implement infection prevention and control strategies related to hand hygiene"). Means, standard errors, and the number of respondents in each subgroup for the 76 tasks were calculated and then evaluated by the Task Force.

Various decision rules were considered and discussed. A total of 12 decision rules were established by the Task Force to determine tasks that should be eliminated from the examination specifications. The first decision rules helped ensure that only those tasks that were clearly a component of practice were included. Three tasks for which 13% or more of the respondent group indicated the task was not necessary for the job were eliminated. Next, two tasks with a mean rating of importance were eliminated because the Task Force determined that the tasks were not sufficiently significant to practice. Then, a total of 10 decision rules related to subgroup analyses were established to ensure that the remaining tasks were significant to practice regardless of: geographic region (comparing responses from the US, Canada, and other countries, as well as regions within the US and Canada), experience as an ICP, bed capacity of the facility, number of ICPs within the facility, CIC® certification status, educational preparation, professional background, and gender.

Application of the decision rules resulted in the elimination of five tasks (Table 2), and left a total of 71 tasks remaining on the final task list. Approximately 6.6% of the tasks were eliminated by the decision rules adopted by the Task Force. The Task Force determined that the remaining tasks could be appropriately assessed by way of a total of 135 multiple-choice examination items to ensure appropriate content coverage.

The Task Force considered the input of the survey respondents, as well as the breadth and depth of the tasks within each content domain, and used an iterative process to determine the number of items that would be appropriate to reasonably sample candidates' knowledge of the domain. Then, the Task Force evaluated each task and agreed upon the cognitive level requirement that a candidate with two years experience would most likely use when performing

Table 2 Tasks removed from the examination specifications

#	Task
14	Determine methods for monitoring and evaluating antimicrobial use
25	Use advanced statistical techniques to describe data (e.g., z-score, Chi-square, odds ratio)
58	Prepare and manage the Infection Prevention and Control Program budget
75	Participate in research activities (e.g., product evaluation, prevalence surveys)
76	Conduct research in infection prevention and control either independently or collaboratively

Table 3 Overview of examination specifications

Content Domain	# of Items	RE-AP-AN*
Identification of infectious disease processes	18	5-10-3
Surveillance and epidemiologic investigation	38	9-23-6
Preventing/controlling the transmission of infectious agents	39	9-24-6
Employee/occupational health	10	2-6-2
Management and communication (leadership)	16	4-9-3
Education and Research	14	4-9-1
Total	135	33-81-21

*RE-AP-AN shows the number of items requiring recall, application, and analysis.

ABSTRACT

Background: The Certification Board of Infection Control and Epidemiology, Inc. (CBIC) provides direction for and administers the certification process for infection prevention professionals. CBIC performs a practice analysis (PA) survey every five years to assess the current practice of infection prevention. The last PA survey was conducted in 2005. CBIC conducted the 2009 survey to ensure its certification examination focuses on current infection prevention practice.

Methods: CBIC appointed a Task Force to develop the survey, approve the sampling plan and oversee the distribution and analysis of the responses. After pilot testing, the final survey was distributed electronically to infection preventionists in multiple healthcare settings throughout the world.

Results: A total of 3,771 eligible surveys were received representing a 27.5% response rate. The typical respondent was a female, approximately 50 years old, who is experienced in infection prevention, has worked in healthcare for 25 years and is a registered nurse.

Conclusions: Of importance to a multi-national certification examination is that the specifications for the examinations appropriately reflect the responsibilities of all individuals who will participate in the certification examination process. The respondents agreed that the survey listed the critical tasks currently performed by an infection prevention professional.

the task. An overview of the examination specifications approved by the Task Force, and subsequently by the CBIC Board, is shown in Table 3.

All items (questions) on future examinations will be directly related to a task listed in the new specifications, and all items will be categorized at an appropriate level of cognitive performance (recall, application, or analysis) expected on the part of the candidate.

DISCUSSION

The purpose of the CBIC certification process is to protect the public by providing standardized measurement of the current knowledge needed for individuals practicing infection prevention. The CBIC certification process validates the working knowledge of infection prevention. The CIC® credential indicates a certain level of competency.

The certification process encourages individual growth and study, and it formally recognizes IPs who fulfill the requirements for certification and recertification (2). Because the examination assesses the infection preventionist's competency of infection prevention principles and practice, the exam must reflect current practice. Therefore, CBIC performs a practice analysis at least every five years to ensure the certification exam remains valid. The results of the practice analysis provide the evidence-based framework for the certification exam.

The CBIC completed the 2009 Practice Analysis Survey described herein as a part of the ongoing process to assess the practice of infection prevention. The response rate for the survey was 27.5% compared to 21% for the 2005 PA survey. The results of the survey were used to develop the test specifications for the certification examination. Examination specifications incorporate the detailed content outline and also include other information needed to ensure the development of comparable examination forms. The examination specifications remain confidential and are only used for examination development purposes.

The detailed content outline was revised to reflect the results of the PA survey. For the CIC® examination, the detailed content outline is a listing of examination subject matter in outline form for candidates and item writers. The revised detailed content outline will be published in the CBIC *Candidate Handbook* and will be available at the CBIC website, *www.cbic.org*.

Working under the authority of the CBIC Board, the CBIC Test Committee has begun reclassifying items in the bank according to the new test specifications and the revised content outline. The CBIC Test Committee used the new specifications to prepare the updated examinations for administration beginning in July 2010. Based on this PA, the revised certification examination should more accurately reflect the current practice of infection prevention.

ACKNOWLEDGEMENTS

The CBIC Board wishes to thank the respondents to the 2009 PA survey for their valuable contribution to ensuring the CBIC certification examination process reflects current infection prevention practice.

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Keynote Speaker

Dr. Brian Goldman

Mea Culpa – Creating a Culture of Safety

Tuesday, May 31

Dr. Brian Goldman will recall one doctor's journey to confront his own human frailty and help create a culture of safety in health care. Dr. Goldman digs down to discover the roots of medicine's difficulty confronting and dealing with medial errors.

Professor Didier Pittet

Tuesday, May 31 and Wednesday, June 1

Tuesday, May 31 "Dinner with Professor Didier Pittet", Professor Pittet will present on "Hand hygiene promotion and evidence for success: worldwide perspectives." Tickets are $50 per person; seating is limited.

Wednesday, June 1 "Experiences with Universal Screening – Is It Universally Effective?" Attendees will gain insight into the various perspectives of universal screening to assist with further decision-making. Drs. Pamela Kibsey and Virginia Roth will present the pro and con of the Canadian experience. Dr. Pittet will review European experiences.

Dr. David Butler-Jones

Public Health Agency of Canada Update

Thursday, June 2, 2011

Dr. David Butler-Jones is Canada's first Chief Public Health Officer. He heads the Public Health Agency of Canada which provides leadership on the government's efforts to protect and promote the health and safety of Canadians.

Closing Speaker

Dr. Robert Buckman

How to Communicate So People Will Listen

Thursday, June 2, 2011

In his talks, Dr. Buckman teaches you how to become a better communicator and a more effective champion of your organization's philosophy and ideas. Based on years of research and practical experience, his approach to communication is ideal for anyone who needs to win the hearts and minds of their colleagues.

Celebrity Chef Ken Kostick

Exhibit Hall

Tuesday, May 31 and Wednesday, June 1

Ken Kostick ise one of Canada's top celebrity chefs as well as a much sought after television and radio personality. Ken currently co-hosts *He Said She Said with Ken and Mary Jo* on VIVA Network. On Tuesday, join Ken as he prepares recipes from his latest book, *$10 Gourmet*. On Wednesday, there is a photo opportunity while Ken signs copies of his latest book.

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